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MAY 1, 1998

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CIO

VOLUME 6, NUMBER 11



After the fall 50
Cover photo by Jack Van Antwerp

COVER STORY

An Information Powerhouse

50

Without doubt, poor information flow contributed to the 1979 accident at Three Mile Island. Now the nuclear facility is a model for the effective collection, analysis and distribution of critical data.

By Leigh Buchanan

FEATURES

A New Life for Purchasing

32

Organizations that have reengineered their purchasing processes prove that smart shoppers are made, not born.

By Meghan O'Leary

Liberation Technology

42

Freed from their desks by the marriage of portable computers and wireless communications, workers are putting their offices where their customers are.

By Megan Santosus

Looking for a Few Good Reads

58

When CIOs pass judgment on the value of the business and trade press, the verdict is clear: They can't live with us and can't live without us. . . .

By Tom Vannah

ESPRITSM
Award
guidelines
and entry
form follow
page 68

M O R E ► ► ►

Taking IT
with you 42



Just when you were beginning to understand the old definition of networking, there's a new one. In a world where lots of vendors have figured out how to network their own products, only Novell has spent the last twelve years uniting products from different vendors into one seamless information

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networking company
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stand up?!



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Top 26
priorities



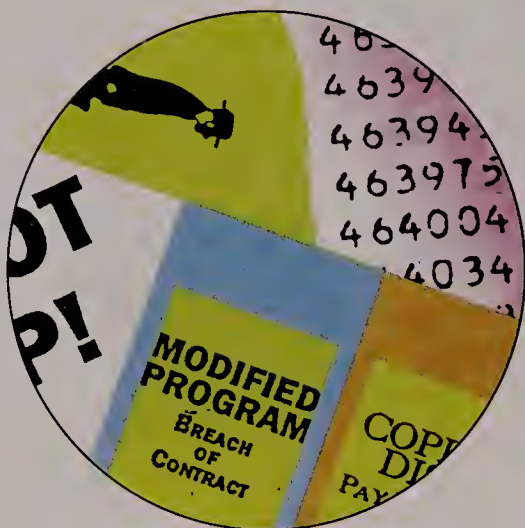
COLUMNS

INSIGHTS: SPECIAL DELIVERY

Critical information systems provide managers with conclusive yet fluid, forward-looking information.

By Thomas P. McAuliffe

26



Let's make
a deal 66

STATE OF THE ART: A NEW LEASE ON LICENSING

Traditional software licenses do not take into account the use of various platforms and machines required for distributed computing. Now vendors and users are working to develop new types of agreements.

By Kathleen Melymuka

66

WORKING SMART: COMPUTER-AIDED BAKE SALES

By centralizing the telemarketing function and providing sales reps with a network to access existing host-based applications, Nabisco has improved customer service and opened the door to expanding its business.

By Megan Santosus

76

DEPARTMENTS

Editor's Letter 8

Publisher's Letter 10

Trendlines 14

- ▶ Czech journal
- ▶ Information superhighway
- ▶ GIS show
- ▶ Calendar of events
- ▶ Social computing

- ▶ Book preservation
- ▶ Online lawyers
- ▶ Vendor warnings
- ▶ Internet radio
- ▶ AI winners

FYI 74

Index 75



Old books,
new life 14



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The idea of technology as an enabler is a prevalent theme in the IS philosophy today, but it seems to be taking awhile for it to take root. It is imperative that information executives tend to the sowing and reaping of the enabled environment.

While the articles in this issue cover a wide range of issues—from the technological innovation in notebook computing to reengineering the purchasing process to a profile on the Three Mile Island nuclear plant—they have in common an underlying theme of organizations re-ordered through information.

In her article "A New Life for Purchasing," starting on Page 32, Senior Writer Meghan O'Leary reports on the reengineering of the purchasing process at Pacific Bell, TRW's Electronic Products Group and the State of Oregon's Department of General Services. Aside from the productivity payoffs of shorter order-fulfillment times at reduced costs, these companies have pushed decision-making out to workers in appropriate business units. As a result, PacBell is able to have its employees concentrate on building more solid relationships with suppliers, and the State of Oregon's bidding process has become more competitive.

The continuing improvements in mobile technology combined with wireless communications are creating the concept of the "virtual office"—or at least the untethered one. Many forward-thinking IS executives see portability as a new order at companies that are restructuring and employing fewer white-collar workers. Writer Megan Santosus explores this theme in her article "Liberation Technology," beginning on Page 42.

One remarkable turnaround has been the Three Mile Island nuclear plant. Associate Editor Leigh Buchanan visited the site of the infamous 1979 accident. Once near bankruptcy, TMI has emerged in a new light. Our article "An Information Powerhouse," beginning on Page 50, describes how technology enables plant workers to do trend analysis by providing them with up-to-the-minute information on plant operations.

These examples reveal that technology has become the backbone, not the focus, of today's enabled organization.

Marcia Blumenthal

P.S. Last chance! Our Esprit Award competition closes May 15. Look for the application after Page 68. We want to hear about your accomplishments.



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Editor-in-Chief MARCIA BLUMENTHAL

Managing Editor LEW MCCREARY

Art and Design Director MARY LESTER MARSHALL

Special Projects Editor ALLAN E. ALTER

Associate Editor ABBIE LUNDBERG

Associate Editor LEIGH BUCHANAN

Senior Writer THOMAS KIELY

Senior Writer MEGHAN O'LEARY

Senior Writer RICHARD PASTORE

Writer/Researcher MEGAN SANTOSUS

Assistant Art Director MOIRA GILLIS

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Registrar ELIZABETH L. LADENDECKER

Administrator, Exec. Programs CHRISTINE MCCARRON

Contributing Writers Thomas P. McAuliffe, Kathleen Melymuka, Tom Vannah

Contributing Copy Editor Carol Zarrow

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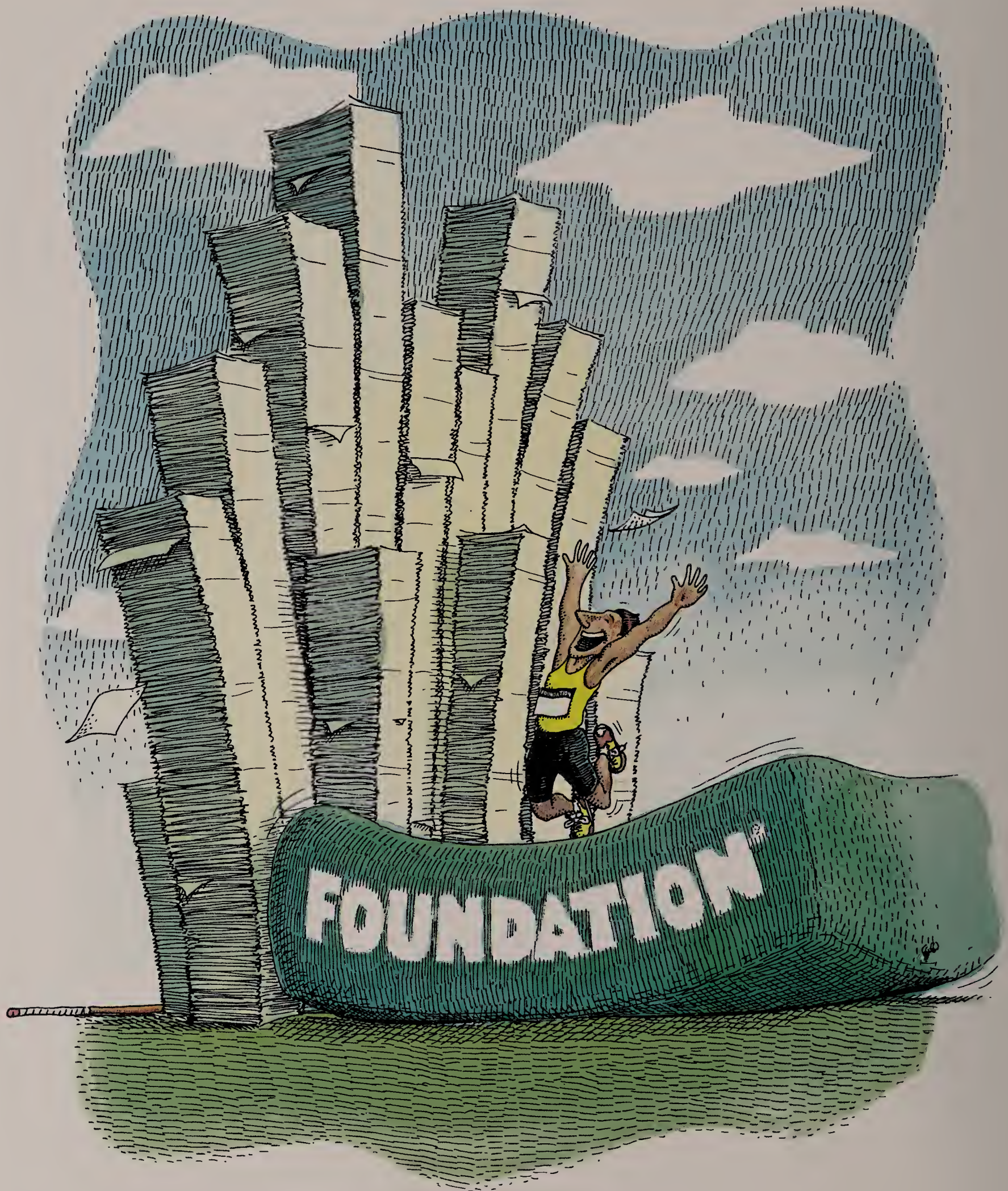
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THE CIO PERSPECTIVES SERIES SM

THE POLITICS of IT:

Reordering the Enterprise

The mood of America has changed.

In response, we've elected political leaders who reflect this new spirit. Corporate leadership has come under tremendous pressure. With the spectre of information haunting organizations, there isn't any doubt that the CIO will have to make changes based on a new constituency.

To ignore politics can be fatal.

Which is why we are focusing our fall CIO Perspectives conference on the politics of IT. Jack Kemp, David Kearns, and the heads of information technology from Viacom International,

Kentucky Fried Chicken and United States Metalworks—to name a few—will address politics in their own organizations. And Rich Tennant, editorial cartoonist, will help us look and laugh at politics in our own companies.

Mark your calendar—October 17-20.

Join the leaders in technology, business, public service and humor. See the newest technology and hear the most current thinking on the development strategic systems. And find out why politics plays such an important role in your organization.

October 17–20, 1993

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"The companies that figure out how to exploit the benefits of mobile technology are going to strengthen their competitive positions."

—Tom Miller
Vice president of home
office research
LINK Resources Inc.

Mobile computing has come a long way from the days of hefty laptops with hazy black-and-white screens. Yet despite all the technological advances, analysts say the real potential

of mobile technology will only be unleashed when portability is integrated with the wireless communication capabilities of radio and cellular technology. Some companies have already harnessed that power.

From the sales trenches to customer-service departments to warehousing and distribution facilities, mobile computing is increasing companies' productivity and efficiency. "Liberation Technology," starting on Page 42, demonstrates how organizations are using this technology as a strategic weapon to improve customer service and real-time data management. "With these tools, we're able to make better business decisions because we can notice trends quickly," points out Scott Thomas, vice president and director of MIS for the Foothill Group Inc.

If you are partnering with the sales/marketing department or the plant/warehouse manager to bring about improved customer service or greater productivity through mobile computing, "Liberation Technology" will give you some concrete examples of successful applications. Mobile computing, probably more than any other form of technology, will shape your company's customer-service role in the years to come. And in the 1990s, without excellent customer service, your days are numbered.

Wynne L. Lutz

P.S. It's time to gear up for the next CIO Perspectives Conference, "The Politics of IT: Reordering the Enterprise." It will be held Oct. 17-20, 1993 at the Westin Mission Hills in Rancho Mirage, Calif. For more information, please call our toll-free hot line at 800 366-0246.

Coming In CIO

Strategic Outlook: Enterprise Networking

The lure of the LAN is a powerful one, enticing corporations with promises of greater operating efficiency and increased revenues. Companies that succumb, however, might be surprised to find themselves up against some tough philosophical and practical issues. In LANs, as in life, it appears that the best advice is still—*caveat emptor*.

Second Opinions

New York-based Home Insurance has a dilemma: Should it renovate its outmoded and unresponsive legacy systems—or toss them on the scrap heap? A panel of experts offers Home Insurance some advice, in this first installment of a new CIO feature called "Second Opinions."

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MCMXCII

Focus Toolset At Home On Rightsizing Turf.

BY MICHELE HUGHES

LOS ANGELES, CA — Rightsizing pioneers are finding a familiar friendly face on the application development scene. FOCUS for UNIX provides the world's

most widely used 4GL for decision support application development and end user computing. The FOCUS Report Writer is widely regarded as the most powerful data transformation tool available for relational and non-relational sources.

IBI Eludes Closed System Constraints.

BY MARVIN HOWARD

NEW YORK, NY — Open Enterprise Information Systems are now a reality through a unique set of data access and interoperability products from Information Builders, Inc. FOCUS for UNIX users can access corporate host data, while UNIX systems do double duty as powerful server platforms for desktop PC users. Bi-directional client/server capabilities allow users of PC/FOCUS and other desktop tools to access UNIX-based data or be routed directly to the corporate host.

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TRENDLINES

CZECH JOURNAL

PRAGUE SPRING II

Bruce Damer likes to keep a copy of the book *Decline & Fall of the American Programmer* handy. Working in Prague, in the Czech Republic, Damer manages software development for Elixir Technologies Corp., an Ojai, Calif.-based vendor of document-composition systems. For him, Ed Yourdon's caveat offers a nice reminder of many of the problems he hasn't faced since he arrived in the heart of Bohemia three years ago.

"The engineers here are

shop in the capital of the newly partitioned country. The corporate logos of vendors such as Digital Equipment, Apple Computer, Xerox, IBM, Toshiba and Canon are prominently displayed on signs, tram cars and rooftops throughout the city. Such activity is a welcome change from the days when engineers at Prague's Mathematical Machines Institute meticulously copied mainframes smuggled in from the West.

And high-tech isn't the only industry new to town.



the most talented I've ever worked with," Damer said. "Ten people can produce the same amount of high-quality work as dozens of American programmers."

In addition to their extremely high technical skills, Damer is impressed with the enthusiasm, dedication, loyalty and commitment to quality demonstrated by his Czech staff. In fact, Elixir is so satisfied with its Czech operations that it plans to move all of its software development from California to Prague in the coming months.

Elixir isn't the only high-tech company setting up

Since 1989, the center of Prague has become home to hundreds of private restaurants, hotels, shops and small businesses.

Still, the legacy of decades of isolation can't be wiped out in a few years. Among the most serious threats to economic development are an antiquated telephone system, severe pollution, a rudimentary tax system and constantly changing laws.

Outside of his work at Elixir, Damer is trying to tackle the problems hindering the growth of the Czech software industry. An affable Canadian who arrived in Prague by way of Los Ange-

les, Damer works with the Prague Center Institute, a research foundation based on the Xerox Palo Alto Research Center. The Institute is affiliated with Prague's Charles University and the World Centers Project in Ojai and aims to sponsor research fellowships, provide guidance for establishing software businesses and facilitate international exchanges for faculty and students.

At the moment, the Institute needs funds to renovate and equip a facility near the University. The 500 students in the University's department of informatics have no textbooks and must make do with a donated network of 386s.

Along with Professor Rudolf Kryl, Damer is visiting the United States this

spring in the hopes of landing sponsors. A \$50,000 contribution will enable sponsors to participate in research programs that Damer asserts "will involve some of the brightest students in Eastern Europe working on creative solutions." With support from the West, Damer envisions that the Institute will provide the basis for an entire industry in the Czech Republic.

"The country doesn't have many options for economic prosperity," he said. "With the energy and resourcefulness of the people, establishing a software industry is one of the best hopes for the future."

Additional information about the Institute is available from the World Centers Project, P.O. Box 1471, Ojai, CA 93024. ■

FIRST, LET'S CONNECT ALL THE LAWYERS....

They used to talk shop over beers at the Courthouse Bar & Grille. Now they can meet in cyberspace to trade sample briefs, research memoranda and news of developing case law.

American Lawyer Media, an affiliate of Time Warner Inc. that publishes *The American Lawyer* and *Legal Times*, among other national and regional legal journals, last month launched an online service that will enable in-house corporate counsel and outside law firms to share their work and avail themselves of the special talents of other lawyers.

Described by its creators as "a shopping center for legal expertise," the system, called **Counsel Connect**, includes an electronic-mail component that lets users get in touch with those whose resources are listed through the service. Although the process of ramping up and signing on "anchor tenants" will go on through the spring, **Counsel Connect** is partially operational now.

Once law firms and corporate legal departments are spliced in through links to their own E-mail systems, they will have access to a gradually increasing volume of conference, bulletin-board and seminar information. Databases of memos, briefs, pleadings, specialist directories and indexes to Court TV and legal publications will go online in the fall. Until then, the monthly subscription fee is waived.

Counsel Connect can be reached at 800 955-5291. It's good to know there's one-stop shopping for lawyer jokes. So: What do you get when you cross a lawyer with an armadillo? A bill. ■

Of Course!

Sometimes solutions are that easy. All it takes is the right stimuli: see something, hear something, put your hands on a product, speak to an expert, and it's there. Your response is, **of course**.

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TRENDLINES

INFORMATION SUPERHIGHWAY

ROAD WARRIORS

What do IS executives and Bill Clinton have in common? Both are concerned with whether, when and how much to invest in new technology. The information superhighway was an attractive plank in Clinton's campaign platform and is a pet project of Vice President Al Gore's. But now that they're in office, it has begun to attract the kind of controversy usually associated with spotted owls. Here, for example, is an excerpt from a face-off that ran in the pages of a recent *New York Times*. Championing the superhighway is Eric Benhamou, president and chief executive of 3Com, a global data-networking company. The guy with the cold water is Michael Botein, a professor at New York Law School.

Benhamou: "An information infrastructure can greatly exceed the impact of the space program and the national highway system combined. It will change the way we live, work and play. It will have a profound effect on our ability to regenerate excitement, enthusiasm and job growth in America."

"While computer companies have emphasized the benefits of people working with computers, a data highway will put people in touch with one another and enable broader access to information resources, delivering even greater benefits...."

"The imperative, the technologies and the people to get the National Information Infrastructure off the ground exist today. What are we waiting for?"

Botein: "Global data highways are likely, if not inevitable, within 20 years, but to build them now would be premature. Moving too soon

would be likely to leave America with the world's first, but worst, fiber-optic system...."

"Creating a fiber system in the next few years would not only be costly—estimates vary from \$100 billion to \$300 billion—but would also use relatively unsophisticated technology. The prize for being the first might be low technology at a high price. France found this out the hard way when it built an experimental fiber system in the 1980s; it cost almost \$10,000 per customer, and its channel capacity was obsolete from day one."

"Fiber-optic superhighways? Yes. Now? Absolutely not." ■

PAGE SAVERS

Multimedia bigots may believe that books are an information medium of the past, soon to be eclipsed by digital and visual media of all kinds. But IT specialists at Cornell University are using digital technology to give books a second life.

About one-third of all books on shelves in libraries throughout the world are in brittle condition—a fate that faces millions of other volumes published since the mid-19th century (when papermakers changed their production processes, resulting in paper containing mortal residues of acids). Now Cornell's libraries and IT department have collaborated with Xerox Corp. on a plan to use high-speed, high-resolution digital scanners to reincarnate decaying texts.

In a pilot project supported by Sun Microsystems, Cornell technologists scanned over 1,000 fragile books—capturing half-tone images and surrounding text—and stored them on magneto-optical disks. The books were then printed anew, using laser printers and acid-free paper. Cornell is also providing electronic access to the scanned collection on the Internet for users

with Macintosh or Sun machines.

Best of all, says M. Stuart Lynn, vice president of information technologies at Cornell, digital scanning is price-competitive with traditional but less convenient preservation tactics, such as microfilming or photocopying. ■



ILLUSTRATION BY FRAN O'NEILL

THE EXPERTS' CIRCLE

The intelligence may be artificial, but the payback is real. A recent competition sponsored by the American Association for Artificial Intelligence highlighted applications that provide short-term payback and clearly documented savings.

The 16 winning applications will be honored at the Association's conference in Washington, July 11-15. They include Compaq Computer's Quick-Source, a customer-service system that puts AI technology directly into the hands of business users, making them, in effect, their own help desks. IBM turned out three winning systems; all improve production efficiency and problem-solving capabilities in the company's manufacturing areas.

Other winners include NASA's PI-in-a-BOX (a knowledge-based system for space-science experimentation), Canadian Paper Mills' Pitch Expert (for analysis of pitch problems in pulp/paper production), Ford Motor Corp.'s CAPE (computer-aided parts estimating system) and Northrop Corp.'s GCESS (for defense-missile diagnostics).

"The importance of these applications to critical organization tasks solidly confirms the movement of AI into core business operations," said Phil Klahr, chairman of the conference. "The acceptance committee was particularly impressed with the integration of all these systems into the larger information-management world." ■

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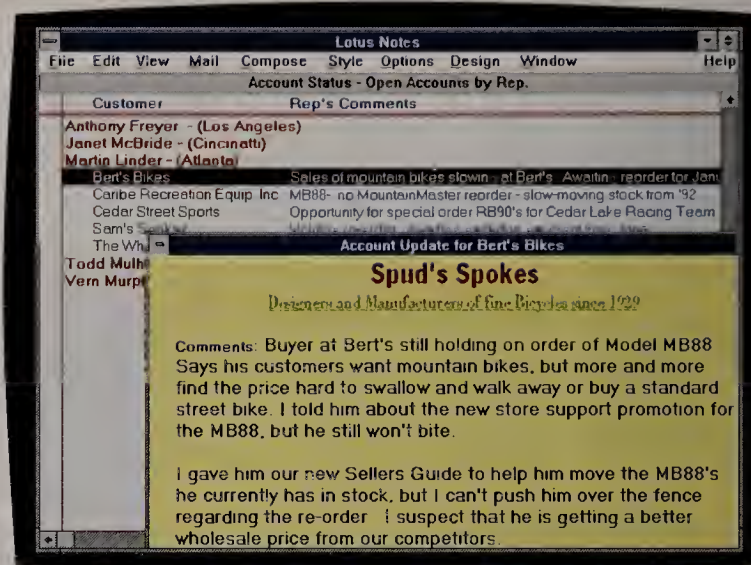


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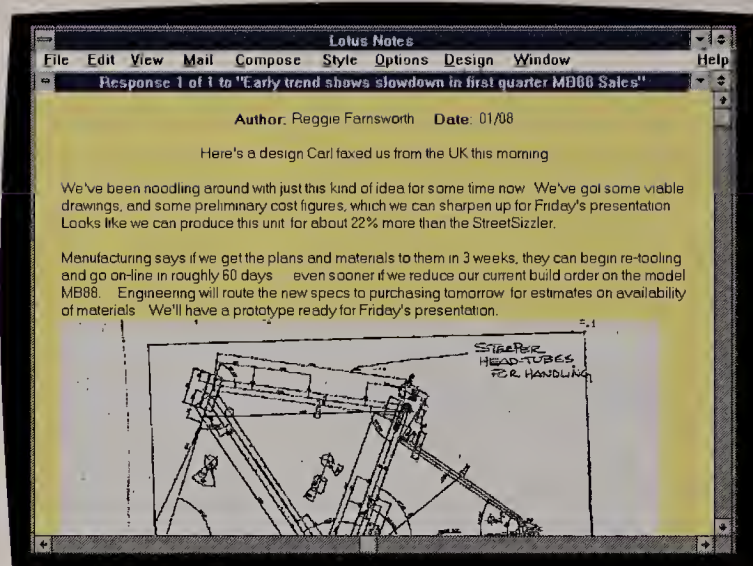
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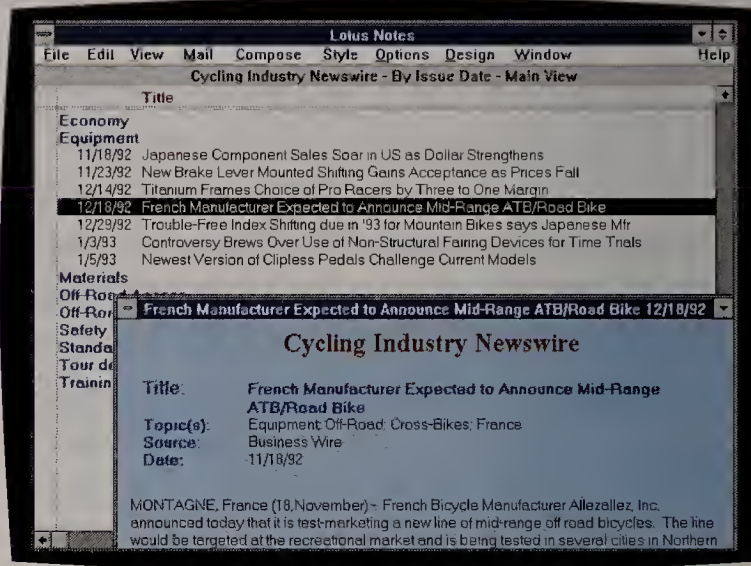
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5. The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

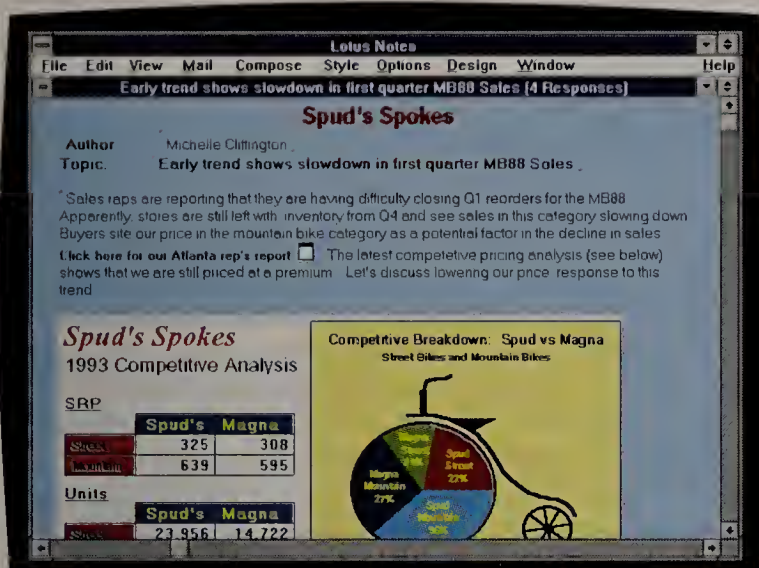
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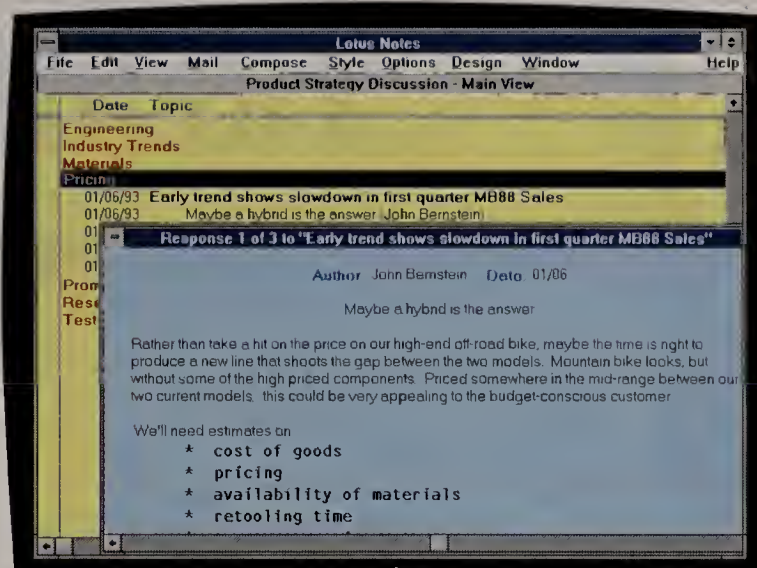
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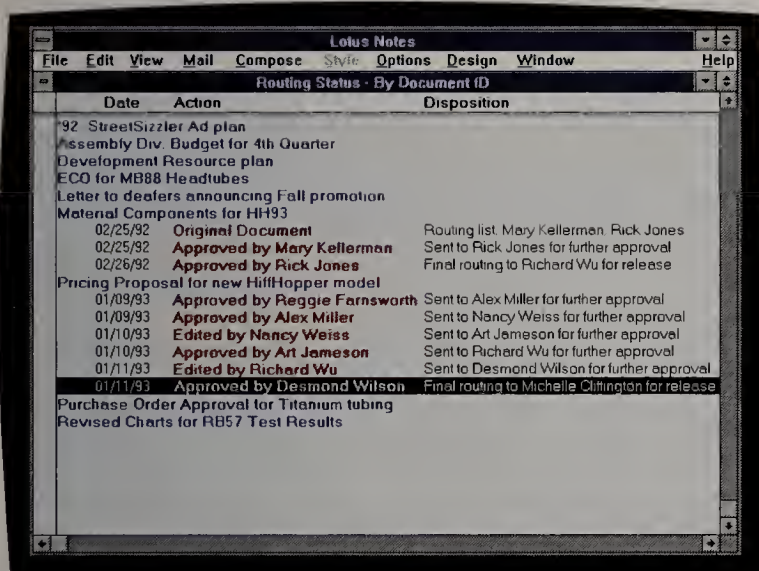
Michelle Clifflington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market. See how she accesses, tracks, shares and organizes



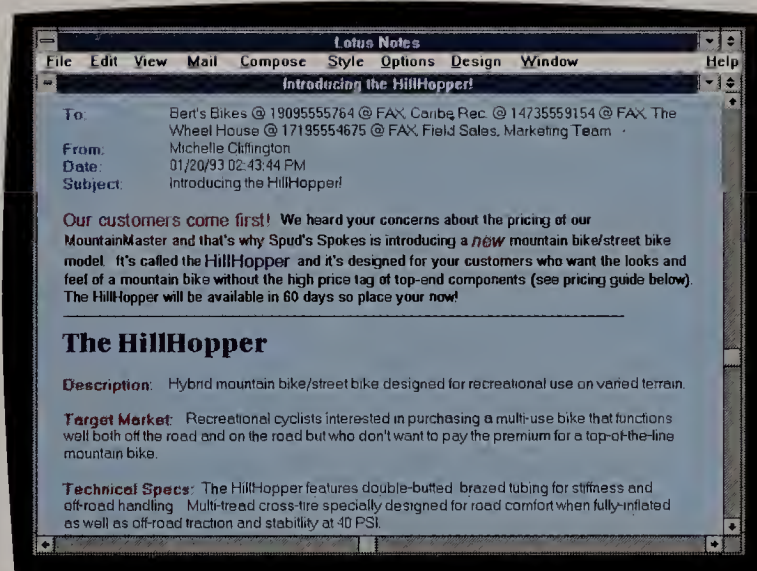
3. She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with h Michelle shift gears.

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TRENDLINES

GEOGRAPHIC INFORMATION SYSTEMS

MAPS FOR THE FUTURE

If activities in Boston are any indication, geographic information systems (GISs) are about to go mainstream. At the recent GIS in Business show, 50 vendors exhibited their products while several end users and consultants discussed the business benefits of the technology.

According to Donald Cooke, president of Geographic Data Technology Inc.,

explained. "All companies have a significant spatial component, in that the location of their headquarters, branches, sales territories and customers are important factors," Cooke said. "By expressing the addresses contained in databases in geographic or visual terms, a GIS can have a big impact." Cooke anticipates that off-the-shelf database and spreadsheet packages will

transportation services. Conrail is currently piloting 16 GIS applications in the areas of property management, engineering and marketing. The technology has reduced functional barriers among departments, enabled a layering of the management structure and helped Conrail become an efficient, networked organization.

"Visual data changes the way people make decisions," Betak said. "GIS allows anyone in the company to make a query regarding location reference, and this helps us provide better service."

The exhibit floor was crowded with vendors demonstrating their GIS products, many of them colorful and highly intuitive.

Wide-ranging applications included store layout and planning, marketing management, demographic analysis, real-estate management, site selection and mobile-worker deployment.

Among the most interesting—at least for personal use—was CityGuide. Based on an off-the-shelf road-map database from Etak Inc. of Menlo Park, Calif., CityGuide highlights the best hotels and restaurants (according to price range, location, type of cuisine, etc.) in many U.S. cities and maps out the best route to reach them.

The well-attended show was sponsored by GIS World of Fort Collins, Colo. The 1994 event is scheduled for San Francisco. ■



a vendor of mapping databases in Lyme, N.H., the traditional markets for GISs are governments, utilities and forest-products and oil-exploration companies. Increasingly, however, a broad range of organizations are putting GIS technology to work, Cooke

soon contain standard GIS features.

Sessions during the three-day event addressed applications in transportation, retailing, marketing and finance. John Betak, of Conrail, described how GIS will help his company provide seamless

THE LONE RANGER WEARS POCKET PROTECTORS

Remember when the whole family gathered in the living room to listen to the big console radio? Mom darning socks, Dad dozing in his armchair, the kids sprawled on the rug? Fast-forward to 1993: The radio is now a computer terminal, and Dad or Mom is a subscriber to the Internet. Voila! Internet Talk Radio.

According to Executive Producer Carl Malamud, Internet Talk Radio is modeled on National Public Radio, specifically NPR's *All Things Considered*. Its goal is to provide in-depth technical information to the Internet community (now more than 14 million people in more than two dozen countries) and to cover topics that don't make it into the computer trade press. It first "aired" on the Internet in late March, sponsored by publisher O'Reilly & Associates, of Sebastopol, Calif., and Sun Microsystems.

A weekly half-hour interview show titled *Geek of the Week* is the inaugural offering. *GOTW* features technical interviews with key Internet personalities—for example, Milo Medin of the NASA Science Internet.

Internet Talk Radio also offers mini-features, such as "The Internet Hall of Flame" (a program highlighting nonlinear behavior on network mailing lists) and "Book Byte" (reviews by Dan Doernberg of Computer Literacy Bookshops).

Unlike conventional radio, Internet Talk Radio is "asynchronous"; listeners can start, stop, rewind and otherwise randomly access programs. Although Internet Talk Radio is now "canned"—preprogrammed and mastered onto digital audio tape—eventually Malamud hopes to develop it into a daily, live, interactive news forum—"a town crier in the global village, a pioneer in desktop broadcasting." ■

CORRECTION

The March 1993 Editor's Letter mistakenly reported that according to a Deloitte & Touche survey, 31 percent of IS staff members were dismissed in 1992. The study actually showed that the turnover rate for application-development staff had stabilized at about 8 percent a year, and that 31 percent of staff members who left their positions were fired. CIO regrets the error. ■

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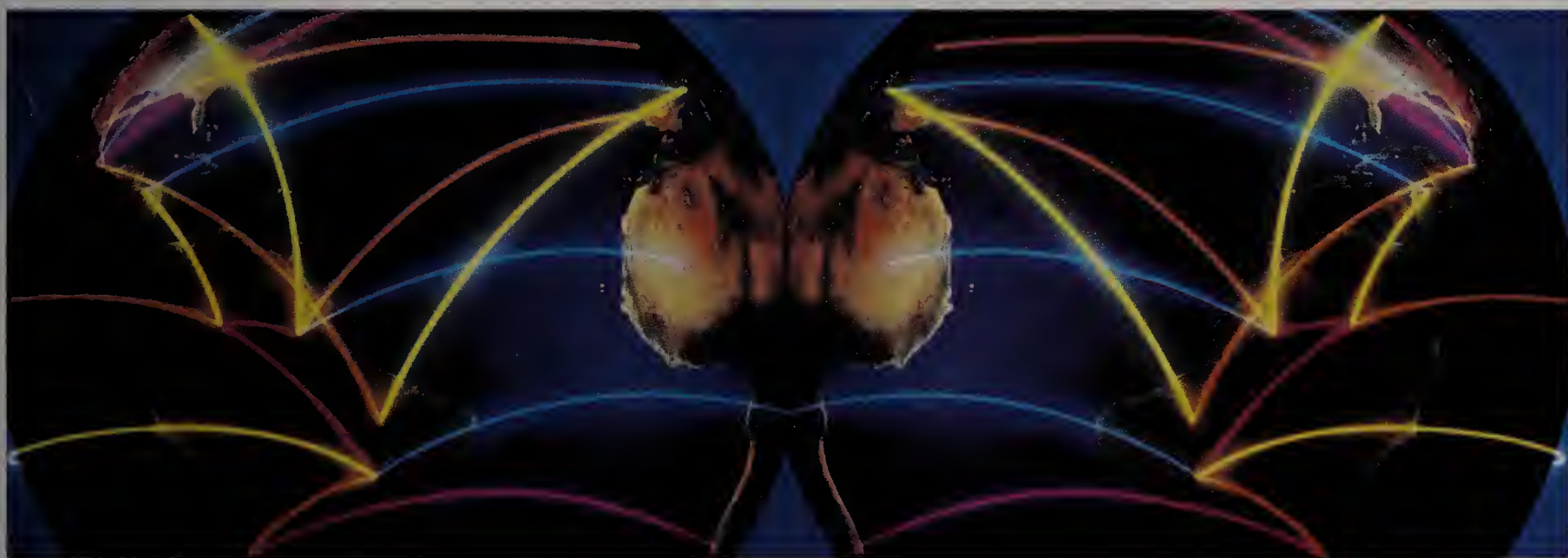
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TRENDLINES

EVENTS

Decision Support and Executive Information Systems: Sharing Information with the Enterprise

Hyatt Regency Hotel, Cambridge, Mass.

June 7 & 8

*Decision Support Technology Inc.
617 354-6400*

Speakers will discuss developing and implementing executive information systems. A practitioner panel will describe specific DSS and EIS implementation challenges, and a panel of tool providers will present case studies and solutions. Registration fee: \$995.

Current Issues in Managing Information Technology: The Distributed IT Organization of the 1990s

Hyatt Regency Hotel, Cambridge, Mass.

June 28-July 1

*Center for IS Research, MIT
Sloan School of Management
617 253-2348*

This seminar addresses the critical managerial, organizational and technical issues related to the changing roles and responsibilities of IS management. General sessions will cover the aligning of business and IT strategies, the challenges of globalization, executive support systems, IT outsourcing, connectivity

and improving systems development. Registration fee: \$2,400.

Electronic Commerce: How IT Will Change Enterprisewide Systems and Strategies

Ritz-Carlton Buckhead, Atlanta

June 27-29

*Gartner Group Inc.
203 967-6757*

The business value of electronic commerce will be demonstrated through the analysis of user strategies and comparisons of case studies. E-mail, EDI, workflow, electronic forms and shared databases will be examined. Registration fees: \$750 for Gartner Group clients; \$1,500 for others.

Business Process Reengineering: Using IT to Renew the Business

*Chicago Hilton & Towers,
Chicago*

July 13-15

*Digital Consulting Inc.
508 470-3880*

This seminar includes case studies of companies that have successfully implemented BPR, creative workshops involving role-playing, an introduction to new technologies such as workflow, and a review of business and technology trends. Registration fee: \$1,095.

LET THE PC BUYER BEWARE

The Surgeon General warns you about smoking. The FDA tells you when not to order the hamburger at a fast-food franchise. And now the Gartner Group has begun alerting companies that certain PC vendors may be hazardous to their health.

Analysts with Gartner's Personal Computing service monitor the financial, quality, organizational and service and support problems of designated PC vendors. The Stamford, Conn.-based consultancy then alerts its clients to circumstances that may affect users and buyers.

Gartner's Problem Watch service bases its information on feedback from the company's worldwide base of subscribers, technology vendor briefings, media reports and publicly available financial information.

IBM earned a place on the list because of two quarters of financial losses. Sources in Europe have reported numerous complaints about the quality of Bull/Zenith desktop systems. And the recent relocation of GRiD personnel to Texas, "as well as the loss of sales and marketing staff, [may] jeopardize GRiD's ability to deliver total solutions," the consultant reports.

The aim of Problem Watch is to "alert users to fundamental problems threatening the viability of a vendor, to assess the seriousness of the problems and, where appropriate, to make recommendations on user actions," said Jonathan Yarmis, vice president and service director of the Personal Computing service.

Forewarned, after all, is forearmed. ■



A COMPUTER IN EVERY POT

So what comes after client/server? What's the next big wave in business computing? There is none, the folks at Forrester Research Inc. will tell you. That's because the next computing wave will engulf the

consumer rather than the worker.

Called "social computing," this new computing paradigm will be more mobile, convenient, simple and service-oriented, according to a recent report from the Cambridge, Mass., research firm. The technology will become embedded in the way people live, play and

work by the end of this decade, and by the year 2005 it will be as ubiquitous as desktop computers are now.

The wave will draw its power from smaller, truly mobile computers; invisible operating systems; wireless Internet-like networks; and online services that provide an-

swers, not just access to raw data.

The driving force for the new paradigm will come from vendors who have failed to profit from today's client/server computing, said report author William Bluestein. Social-computing vendors will model themselves after Sony, Nintendo and even MTV. ■



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Critical information systems provide managers with conclusive yet fluid, forward-looking information

BY THOMAS P. MCAULIFFE

Most organizations today are being asked to be more productive with smaller budgets and fewer human and material resources; to move faster, know more and make fewer mistakes; and to be more profitable in the bargain. As people's capacity to gather and evaluate critical information is reached and exceeded, the management process will either move forward with inadequate knowledge or begin to disconnect from many issues. Either action will create a superficial management process, to the continuing detriment of company performance and competitiveness. The long-standing technology issue is whether an information system can add to the capacity of management in a valuable way.

The value of any information system is determined by the value of the data it contains. Although generally considered a mystery, the value of data to management is easily determined by considering its "intensity": that is, the level of interest in, demand for and present need to have data in order to get on with the most important business at hand.

Consider the rush to telephones between meetings or flights. Observe the harried use of facsimile machines, overnight express mail, voice-mail messaging and cellular car phones. Consider, by comparison, the cursory and often postponed review of monthly financial and manufacturing reports, industry news and competitive reports. Observe how paper accumulates or disappears into filing cabinets as telephone calls and meetings devour the days.

Regardless of the planning horizon, corporate energies are expended on a daily basis and focused on the current operating moment. History, even as recent as last month, will fade as a matter of interest and become a reference point at best. The drive to get the job done is the fuel of intensity. Information that supports this drive will be of intense interest to management, and information that doesn't will be brushed aside. There is not enough time for both.

The few companies that have leveraged this principle own the most successful reporting systems in the world. They have managed to match the content of their systems to the present intensity of their business. In most cases, data is updated frequently and tracks critical events, actions and results. The information can relate to sales of key products, regulatory legislation, critical development programs, disaster-recovery efforts, competitive moves or hostile takeovers.

The focus on what is happening right now means that most critical information must come from other people: those who are involved and/or responsible. This suggests a major—and thus far unexplored—potential for the use of "groupware" by upper management, and it supplies the first essential attribute of a more





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successful reporting system: the ability to move critical data rapidly through a network.

The majority of executive information systems and their paper-based predecessors have focused on structured historical data. It is simply easier to build a reporting system around the most available data instead of the most valuable. This trap creates a serious mismatch between the content of the system and the interests of the management team as it works in the current operating moment, looking forward.

A related trap is lack of specificity. Resolving problems and defining best courses of action require very specific information about people, products, prices, costs, markets, accidents, actions and events. Yet structured reporting systems designed for long-term use must, by definition, be somewhat general. And so the second major attribute of a network or groupware solution is its ability to deliver the most important specifics in a selective, detailed and fluid manner.

The process of business management works largely from the present day forward. Always pressed for time, managers must focus on what has to be done next to keep the business on track toward committed goals. This orientation creates an information hierarchy based on the conclusiveness of the data. The levels of the hierarchy are simply the amounts of work that have already been applied to the information before it reaches the intended management audience. The lower the level, the greater the amount of work remaining to be done; the higher the level, the more conclusive the information as it stands. More conclusive data means quicker digestion and action and, therefore, more productive management interaction.

It should be no surprise that most managers and executives turn to people for critical information. Their information is current, focused on critical issues, forward-looking in terms of next actions, evaluative and conclusive in terms of expected re-

sults, and specific. The third major attribute of groupware is its backbone: a "human network" that is unique in its ability to provide forward-looking information and conclusions.

The human network is probably the most prevalent management reporting system and could be considered nearly perfect, except for one limitation: capacity. For most companies, there are many more important issues and events than there

*Observe how paper
accumulates or
disappears into filing
cabinets as telephone
calls and meetings
devour the days.*

is time to deal with them. There are limits to how much time can be spent on the telephone and in meetings. The chronic inaccessibility of most managers affects the capacity of every management team. This capacity is being stretched even further within a global economy that demands more corporate excellence than ever before.

The value of the human network and the need for expanded capacity suggest new applications of technology and a new management application of groupware: the critical information network (CIN). The basic requirements of this reporting system are speed and flexibility. Nothing is fixed or structured except the network itself; traditional databases are not required; no in-depth study of corporate issues is necessary. Predefined reporting formats are important, but the content is fluid, determined by the issues of the day and the priorities of senior and peer-level management.

The scope of a CIN is as large as the network of executives, managers

and individual workers who generate and consume critical information. The system's capabilities must likewise be ambitious in order to accommodate diverse, large, complex reports and analyses—any type of information (charts, diagrams, spreadsheets, ad hoc analyses) is fair game. Filing structures should be established to emphasize organization by issue more than by source, reporting period or function. In contrast to standard reporting structures, this orientation reflects the nature of the problem at hand rather than the functional structure of the company, thereby greatly enhancing the usefulness of information.

In many ways, this process is not new. Most companies already have some methods of dealing with critical information. These likely consist of telephones, meeting rooms, express mail, facsimile machines and perhaps electronic mail. The goals of a CIN are to integrate and expand these capabilities and to empower the organization further.

What is new to the process is a rapidly expanding set of tools that are beginning to make CIN systems viable. Current groupware tools, still in their infancy, typically involve collaborative, peer-to-peer communication. This is a largely horizontal view of interaction, in which individuals of similar rank share and coordinate work.

As the application of groupware grows toward its full potential, it will quickly find its way into the middle- and upper-management ranks, where high-speed vertical movement of critical data is a necessity, and the need for tight coordination across operations and time zones is crucial. The information-sharing characteristics of groupware provide a near-perfect basis for high-intensity reporting systems for all levels of management. ☐

Thomas P. McAuliffe is president of McAuliffe & Co. Inc., a Boston-based consulting firm specializing in online reporting systems and competitive strategies, and coauthor with Carolyn Shamlin of Critical Information Network.

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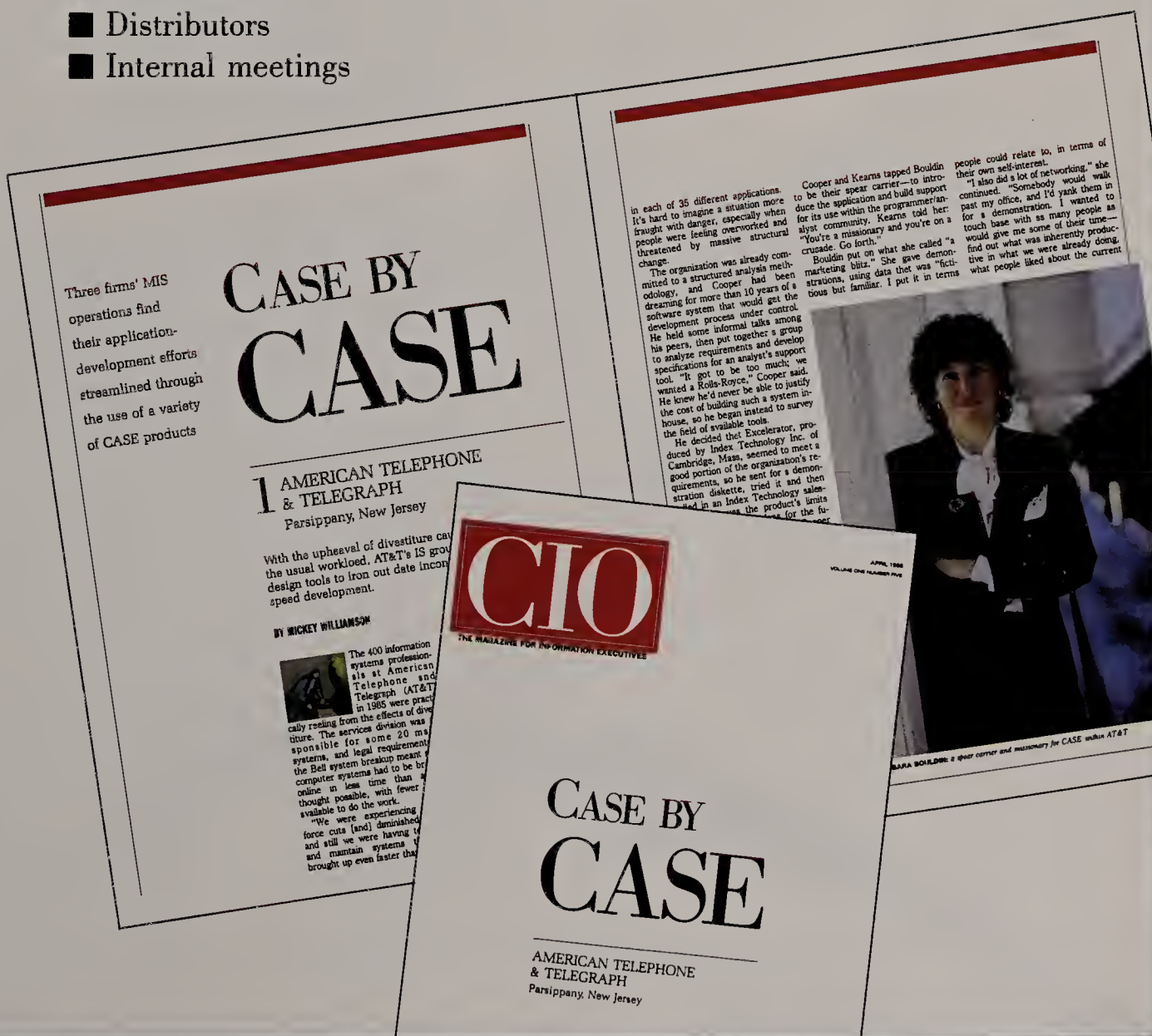
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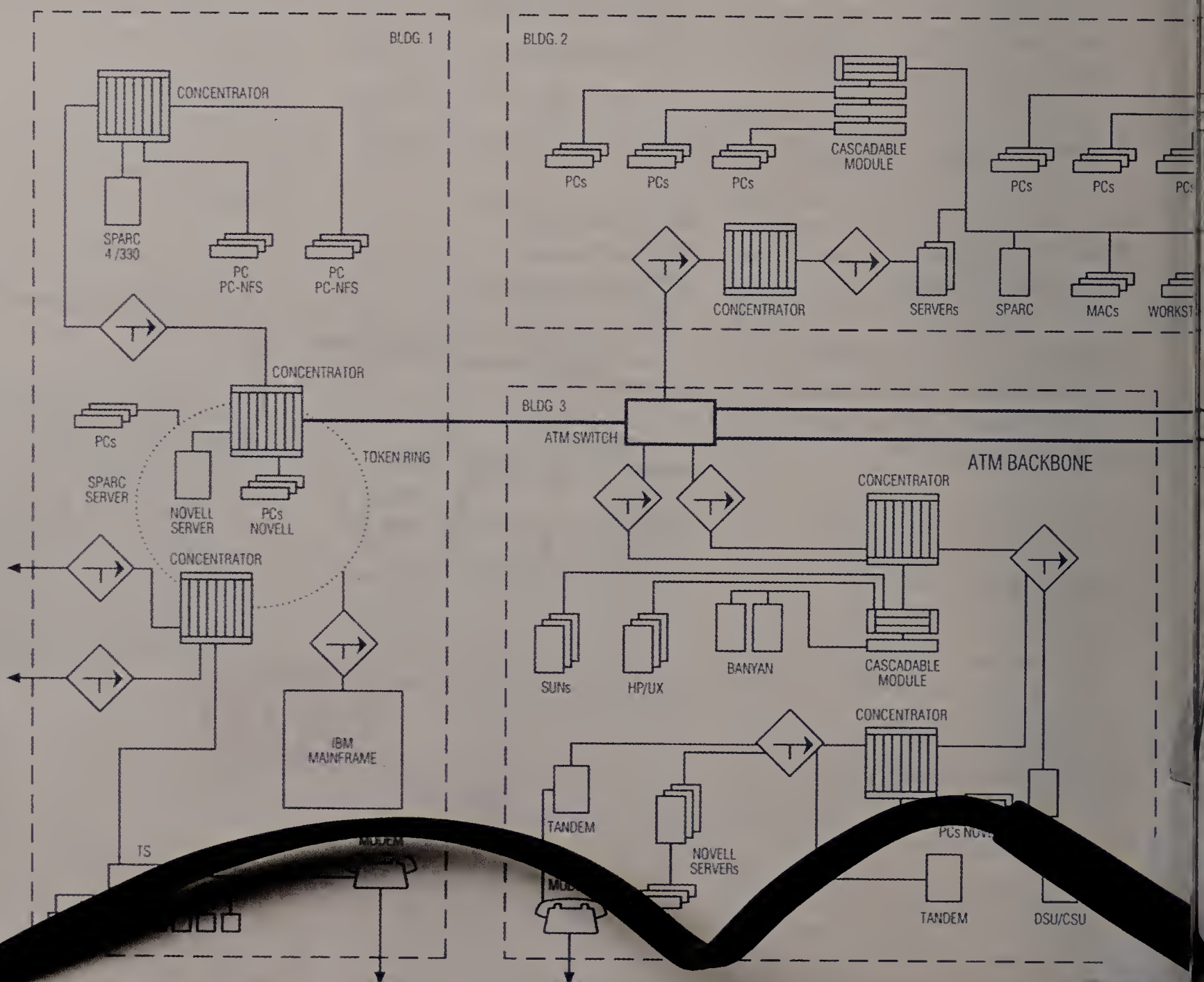
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Organizations that have reengineered their purchasing processes prove that smart shoppers are made, not born

BY MEGHAN O'LEARY

When it comes to reengineering the purchasing process, the name of the game is relationships—between the purchasing department and its internal customers, its outside suppliers and IS. Reengineering offers many organizations the opportunity to broaden and cement their relationships with suppliers and to understand their own internal relationships. Once they dissect their own business practices, many companies find that “purchasing” is not a broad enough term to describe the complex web of interactions that takes a purchase from request to reality.

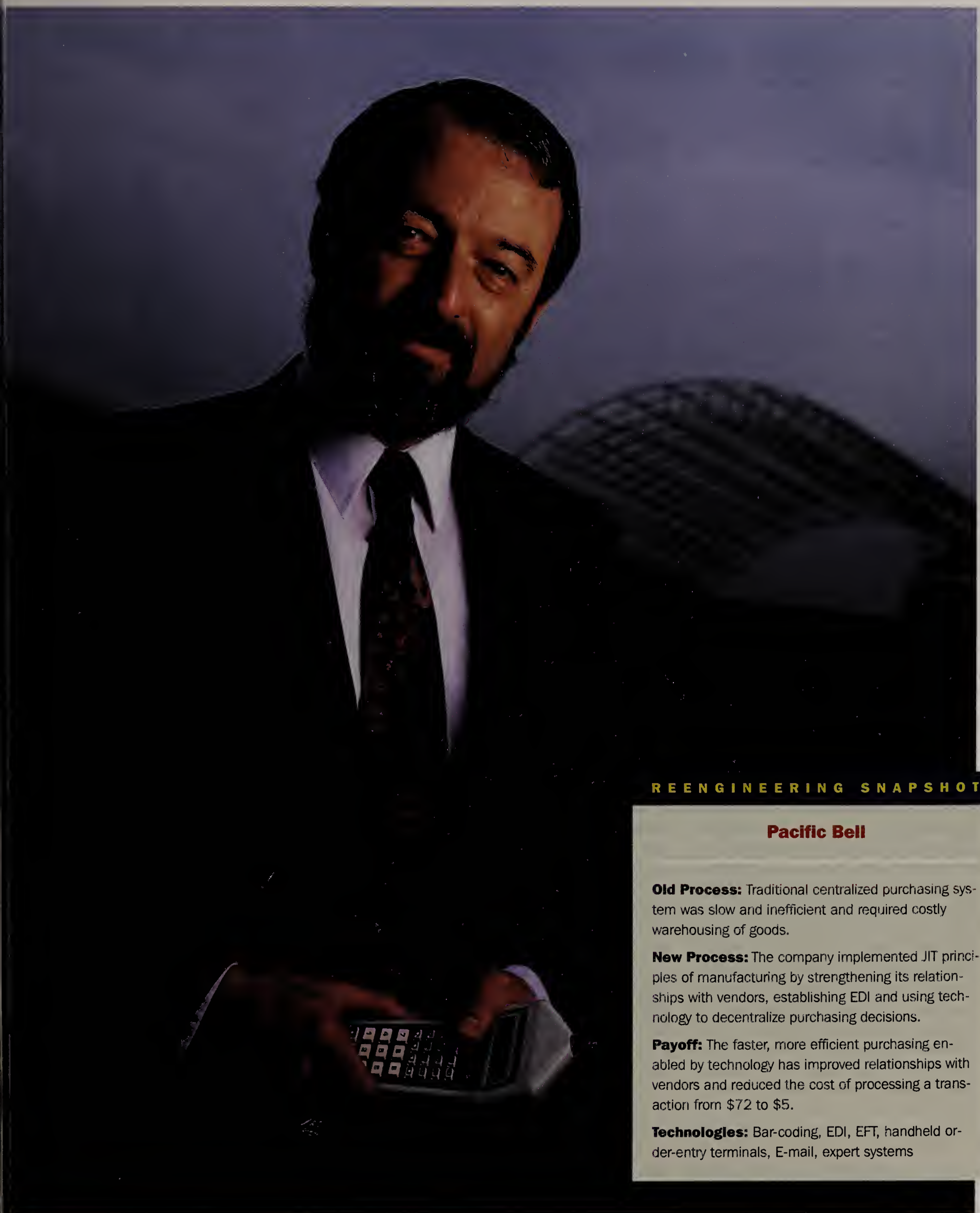
Pacific Bell has created a purchasing process from scratch as part of its overall

reengineering efforts, shifting the focus from processing purchase orders to managing relationships with clients. At TRW's High Reliability Electronics Products Group, the procurement department became a reengineering guinea pig for an entire business division looking for a quick success. The experience highlighted the difficulties of implementing new ideas through IS. And the State of Oregon used technology simply to put the responsibility for researching and initiating bids into the hands of the bidders and to make the process more competitive.

JOSEPH YACURA (left) and **JACK GARRETT** (opposite page) have spent the last four years setting the stage for supplier management at Pacific Bell. Their goal has been to put technology and power into the hands of users and enable them to make their own decisions about purchasing and vendors.



PHOTOS LEFT AND RIGHT BY DAVID POWERS



REENGINEERING SNAPSHOT

Pacific Bell

Old Process: Traditional centralized purchasing system was slow and inefficient and required costly warehousing of goods.

New Process: The company implemented JIT principles of manufacturing by strengthening its relationships with vendors, establishing EDI and using technology to decentralize purchasing decisions.

Payoff: The faster, more efficient purchasing enabled by technology has improved relationships with vendors and reduced the cost of processing a transaction from \$72 to \$5.

Technologies: Bar-coding, EDI, EFT, handheld order-entry terminals, E-mail, expert systems

WHEN PACIFIC BELL REENGINEERED its purchasing department, it reengineered it right out of existence. The name of the organization it created in its place—contract and supplier management—signals the company's commitment to establishing long-term, mutually beneficial relationships with its vendors. The organization fulfills this commitment by using information technology to push administrative decisions and non-strategic purchasing out to regional business units.

PacBell had the enviable opportunity to reengineer its purchasing from scratch. In 1984, after the divestiture of AT&T, the regional Bell operating company (RBOC) found itself lacking a centralized purchasing operation. It spent a few years forming a regional purchasing unit and began building a mainframe system to handle the function. At the same time, it began looking for ways to make the purchasing process more efficient and to save money on warehousing space.

Taking its cue from the just-in-time (JIT) purchasing methods of manufacturing companies, PacBell started benchmarking the best. When Joseph A. Yacura, executive director of supplier management, supplier quality and material systems, came on board in the late 1980s, he emphasized the importance of managing relationships with vendors as a way of establishing JIT purchasing.

Yacura's department determined that its role should be to understand the marketplace and meet the needs of its clients and equipment providers. In order to do that, the department needed to establish performance measurements and contractual terms for vendors, and to design information systems that would monitor vendors' performance against their agreements. Toward this latter goal, he worked with Jack P. Garrett, director of supplier management technology.

Garrett and Yacura have spent the last four years setting the stage for supplier management by putting technology and power into the hands of users and enabling them to make

their own decisions about purchasing and vendors. For example, technicians in the field use handheld devices to plug in orders for equipment and parts using bar codes. The system checks the orders against a database of technician profiles. These detail the kinds of equipment individual technicians are authorized to order, as well as how much money

Yacura is so sure of the direction in which he is taking procurement that he recently guaranteed on-time delivery for internal clients who use the system and are dependent on JIT. If a shipment is late, his department pays for it.

they are permitted to spend. If all checks out, the system places the order.

The system keeps similar profiles of business-unit managers, allowing them to enter orders electronically as well. The orders are bar-coded for easy matching and verification and sent to the supplier via electronic data interchange. Today, 94 percent of the invoices that go through the company's purchasing system are placed via EDI. Purchase orders, invoices and packing lists are all bar-coded as well, and the system automatically authorizes accounting to cut the check to the vendor. As of this writing, Garrett expected to have electronic funds transfer in place for PacBell's major customers sometime this month. So far, the system has reduced the cost of processing a purchase transaction from \$72 for the old paper method to \$5. Bar-coding information has also eliminated rekeying errors and delays.

Use of the system is not mandatory for internal clients, although Yacura and Garrett spend a lot of time selling it. Their list of converts and successes is growing. Yacura is so sure of the direction in which he is taking procurement that he recently guaranteed on-time delivery for internal clients who use the system and are dependent on JIT. If a shipment is late, his department pays for it.

Enabling its users with technology allows Pacific Bell to concentrate on its relationships with suppliers. Every major vendor works with an internal Pacific Bell manager, who visits the vendor's plants and meets with its representatives to discuss their needs.

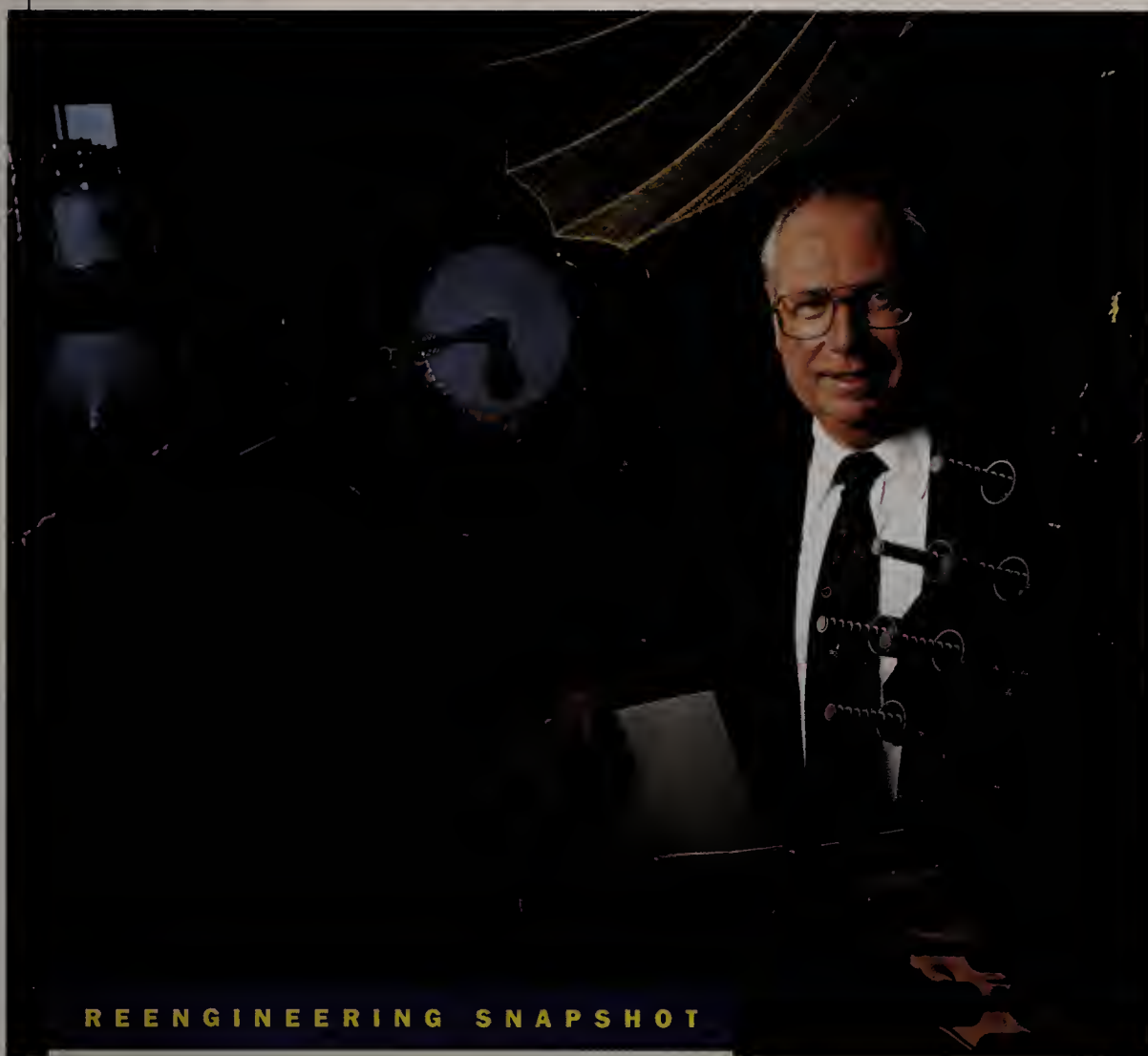
In addition, PacBell managers sit down annually with their largest

providers to review their relationships and establish performance objectives for the coming year. They also issue monthly report cards that rate each company's performance and give details about missed deliveries and mistakes.

PacBell is committed to enhancing its abilities with new and emerging technologies. For example, a financial expert system helps supplier managers make contract decisions. Garrett is currently developing expert systems to analyze purchase-transaction data and spit out recommendations for vendor-performance improvements.

When a supplier misses consecutive delivery dates or makes repeated errors, for example, an expert system could examine that vendor's contract with PacBell and, if the situation warranted it, make a decision to order from another company. Ultimately, the expert systems will alert supplier managers to problems and suggest courses of action via E-mail. They could also be used to prepare supplier report cards.

Such close contact has turned historically adversarial relationships into partnerships. PacBell's relationships with its equipment providers are now based on mutual dependence and mutual gain, according to Garrett. "We help them ensure their products' success and quality, because if they're successful, we're successful."



REENGINEERING SNAPSHOT

TRW's High Reliability Electronics Products Group

Old Process: A bloated bureaucratic procurement process gave buyers little decision-making power and wasted time. An outdated procurement-information system required them to access 23 different databases to get the information necessary to generate purchase orders.

New Process: Decision-making power has been pushed out to the buyers via a LAN and workflow software that automatically checks contracts and prices and generates purchase orders via a single user interface.

Payoff: The system has reduced the time it takes to create a PO from 116 to 28 days. The department has been able to reduce its secretarial staff from 12 to five.

Technologies: AT&T's Rhapsody workflow-automation software and an 80-workstation AT&T Starserver ES LAN

FRED LELAND deliberately excluded IS from TRW's purchase-reengineering project.

makes the intelligent components of spaceships and satellites—brought in a consultant, United Research Corp., to help it implement the principles of total-quality management companywide. After studying the organization's flabby, bloated business processes, however, URC's first recommendation was that TRW try reengineering before it tried quality. The consultant suggested starting with a department that would have an impact on the overall business process: procurement.

URC formed a team of 13 representatives from

procurement, design, material control and engineering to flow-chart the procurement process from beginning to end. "We learned that we were breaking our backs on purchasing," said Fred Leland, the group's procurement manager. "To put it

bluntly, we were doing a lot of bullshit because we didn't know any better." The department identified hundreds of unnecessary steps in the purchase-request process. Many were pure red tape, such as getting approvals from multiple management levels and having the legal department review every bid package. Others were merely a waste of time: The group determined that buyers spent 40 percent of their time returning phone calls they missed while they were at supplier meetings they couldn't hold in their tiny, 42-square-foot cubicles.

In addition, the department's 123 buyers spent hours jockeying among eight shared dumb terminals, accessing 23 different systems, each with its own password and log-on procedures, in order to get the information necessary to complete a procurement package.

The team identified five opportunities for dramatic improvement: hiring a training coordinator to develop a formal procurement training program; educating the department's largest and most strategic suppliers about the impact the new system would have on the ordering process; prioritizing and streamlining the complex combination of procedures and approvals required for purchase-order changes by pushing more decision-making power out to the buying departments; building a powerful, flexible technology infrastructure to simplify and support the newly designed procurement workflow; and redesigning and enlarging buyer workspaces to make room for meetings. The original team broke into five subteams, each taking responsibility for an area of change. The individual teams met together weekly to report on their progress.

The technology team, headed by Leland, recruited 20 people from procurement and other departments and spent five months determining technology requirements and taking bids from suppliers. By December 1990, the group had chosen AT&T's Rhapsody workflow-automation software and an AT&T network running on Starserver ES. The team had the



SANDRA BURT determined to reduce mailing costs and make Oregon's bidding process more competitive.

four-server, 80-workstation Ethernet LAN up and running by February and then worked together with AT&T from March to September to customize the software so that it mimicked the activities of the buyers.

Today, buyers can scan in purchase requests from other departments and use the workflow software to access the appropriate databases and run through all the necessary steps to generate a purchase order automatically. The software allows them to access documents online and compare vendors' prices automatically, and it eliminates the need for price review by another manager. The buyer can fax the appropriate forms from a workstation directly to the designated supplier and receive electronic verification and invoicing the same way. The redesign has allowed the department to reduce its secretarial staff from 12 to five and eliminated the need for expeditors to move documents among departments. In addition, the redesigned system has

reduced the time it takes to create a PO from 116 to 28 days. In a business where an extra week can cost \$400,000, that difference is dramatic.

Leland enlisted the help of some technical-support employees from non-IS departments. But fearing IS would sink the project with a costly, unimaginative mainframe application, he deliberately excluded them, trusting that he could mend fences after the fact.

"Everything dies with them," Leland said. In addition, Leland and Senior Data Services Manager Mike Koch both reported to the vice president who spearheaded the reengineering process, and that gave Leland some authority to do what it took to get the system built. Koch didn't find out about the project until the contract had been signed with AT&T and Leland needed his help to interface his new system to the mainframe.

Despite the expediency of his so-

lution, Leland may have hampered himself in the long run, because he chose to interface his new LAN with the standalone mainframe systems via automatic log-on and procedure calls rather than undertake the complex downsizing of those systems without IS's expertise.

As TRW reengineers other processes, it will eventually have to deal with the IS organization's reputation as a slow mover. Koch acknowledges that this is not the first time a department has chosen to work without him for reasons of cost or speed. Still, despite this awareness, he has no plans to be the next reengineering target.

REENGINEERING SNAPSHOT

State of Oregon Department of General Services

Old Process: State mailed bid information to outdated list of 12,000 vendors for each project.

New Process: Vendors dial in for bid information via PC and modem to the state's central information system.

Payoff: State saved \$100,000 in annual mailing costs, eliminated 14 clerical positions and saved \$8 million on goods and services by generating more competitive bids.

Technologies: PCs, modems, IBM AS/400

SANDRA BURT, ADMINISTRATOR of the purchasing division for the State of Oregon in Salem, believes that government should take a hands-off approach to doing business with the public.

In an effort to reduce mailing costs and make its bidding process more competitive, the state has reengineered its request-for-proposal process, put it online and returned the responsibility for doing business to the vendors. As a result, Oregon has reduced its procurement costs by over \$8 million and opened the competitive process to more minority-owned and small businesses.

In 1989, the purchasing division's bid activities centered around a mas-



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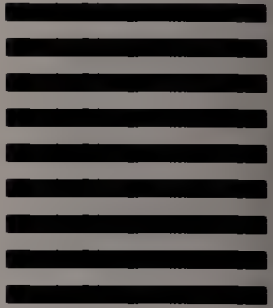
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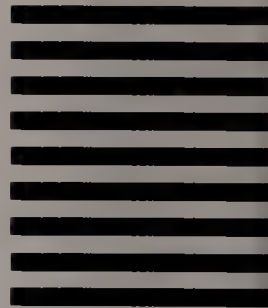
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sive list of 12,000 vendors whom it notified of upcoming RFPs. The mailing list was cumbersome and full of errors, redundancies and outdated information. Word about upcoming projects wasn't getting out fast enough, and each mailing generated only about a 15 percent response rate. In addition, with seven staff members devoted to mailing, the department's cost of doing business was rising.

Burt set three goals: to reduce costs, to put the onus of bidding on vendors and to get information out to them in a timely manner. The division had what it called a vendor-information processing system. The data resided on a mainframe, which vendors could access via a few dumb terminals in the lobby of the General Services building to review RFP specs. Burt estimated that by letting vendors dial in to access and download RFP information with their own office computers, the state could eliminate \$100,000 in mailing expenses annually, keep better track of vendors and costs, and get bid information out faster. She also thought that by opening up the bidding process to any business with a computer and by posting information about bid-award amounts, the system would reduce the cost of goods to the state by generating more competitive bids. The \$100,000 figure alone was enough to convince the committee overseeing the state's discretionary productivity-improvement fund. It loaned her the money to reengineer the system.

Burt worked with Mike Stone, manager of information systems, to develop a system that lets vendors access bid information by dialing into a new IBM AS/400 from their own computers or from 150 state-owned technology centers. In addition, vendors have menu access to instructions for how to file a bid; databases of wage requirements; names of other contractors and subcontractors, including a special section on minority-owned businesses; and the winners and prices of past contracts. The system also keeps them apprised of changes and amendments to RFPs.



MIKE STONE: *In 1992, Oregon spent \$8 million less than in 1991 for comparable goods and services.*

Burt hired a consultant to educate every city in the state about the new system through forums and mailings. An outreach coordinator and a PR firm worked on marketing the system to vendors and training them. She relied on Director of the Executive Department Dan Simmons to gain the buy-in of agency heads, who were skeptical about the new system's ability to generate enough bids. She and Stone worked with the IS managers from each agency to accomplish the electronic connection. For now, the procurement department still enters bid information for the agencies, which use the system more as a reference tool, but Stone says they will soon be able to enter their bid requirements themselves.

On March 1, 1992, Oregon tossed out its paper vendor lists after a three-month switchover period and began requiring its vendors to do business electronically. Vendors register by dialing into the system, which automatically assigns them an identification number and guides them through the process. The system is

so simple that over 30,000 businesses have registered to date.

In addition to saving the targeted \$100,000 in mailing costs, the purchasing division has been able to eliminate 14 clerical positions as a result of implementing the system.

The most impressive results, however, have been in the system's effect on the competitive process, as Burt predicted. Not only does the state now get more bids more quickly on each project—many from small, minority-owned and out-of-state businesses—but vendors are using the database of past contract awards to keep an eye on their competition and offer lower bids. In 1992, Stone said, the state spent \$8 million less than it did in 1991 for comparable levels of goods and services.

In the future, the state hopes vendors will be able to file their bids electronically, eliminating the delays and potential mistakes inherent in rekeying paper bid applications. But Stone admits that he is still dealing with the security concerns surrounding that feature. ☐

WHEN PORTABLE COMPUTERS first appeared on the scene in the mid-'80s, they were seen as ideal tools for boosting the productivity of field-service employees and mobile professionals. As such, the machines were used primarily for on-site data collection and to help reduce the time spent on administrative tasks.

Today's portable computers are smaller, cheaper and considerably more powerful, and they are begin-

communicated back to wherever they are filled. Sales, marketing, accounting, manufacturing and customer-service departments would have seamless access to whatever information they needed to perform their jobs. Rather than simply making employees more productive, mobile technology will make them more effective.

"Communications are becoming more of an absolute necessity," said Jim Bartlett, a mobile-computing executive with the IBM Personal Computer Co. in Somers, N.Y. "Perva-

LIBERATION TECH

ning to be integrated with wireless communications technologies like radio and cellular. Experts say that this integration, more than any other technical development, promises to make the mobile computer a true strategic weapon.

Linking all employees together, regardless of their locations, and giving them access to dynamic information about customers, products and services, is like creating the ultimate wide area network. Imagine bringing the power of a corporate database to a customer's office: Products or services can be ordered on-site and those orders immediately

sive connectivity will be an essential element of mobile computing within the next few years."

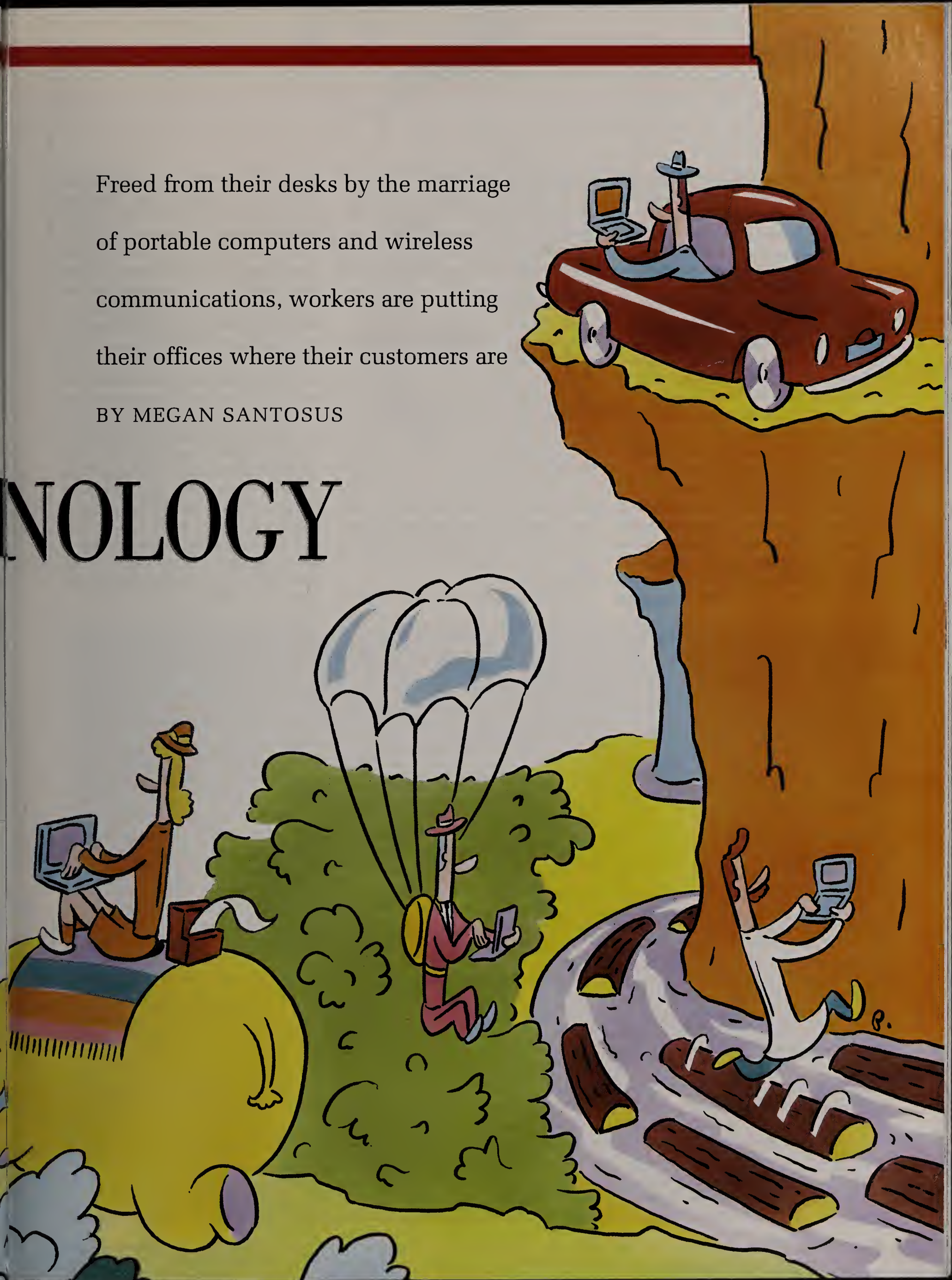
A few significant technical barriers must be overcome before mobile technology can truly become a strategic alternative to desktop platforms. "It's extremely difficult to have an integrated network across every department of a company," said Leslie Fiering, program director of the PC service for the Gartner Group, based in Stamford, Conn. "In order to have a network of highly integrated, multiple-function portable computers, we still need the electronic glue—or middleware—that will tie everything to



Freed from their desks by the marriage
of portable computers and wireless
communications, workers are putting
their offices where their customers are

BY MEGAN SANTOSUS

NOLOGY



gether." Without such middleware, Fiering contends that it might be next to impossible to integrate every application running on different platforms.

In addition, many strategic applications are so data-intensive that they must remain on a LAN due to bandwidth. And the use of cellular technology is hampered by concerns with data integrity. As anyone with a car phone can tell you, occasionally a word or two is "lost" during the course of a conversation. While this is generally acceptable in a voice transmission, it would create major problems in a data transmission.

Finally, business still lacks a high-profile strategic application based on integrated mobile technology. When companies like Federal Express, Frito-Lay and Otis Elevators adopted handheld computers, their applications proved so successful that other com-

panies were compelled to follow if they wanted to remain competitive. While most people agree that integrating communications and mobile technology sounds appealing, no one has yet exploited the combination to become both a model and a competitive threat.

DESPITE THESE IMPEDIMENTS, integration is already beginning to occur on a wide scale. Once this happens, portable computers will become the platform of choice for many workers, freeing them from the confines of an office. "Mobile technology clearly has an enterprise-level impact that goes beyond simply automating certain functions," said Keri Pearlson, an assistant professor in the College of Business Administration at the University of Texas at Austin.

Since communications and infor-

mation flow will be fundamentally affected at all levels of an organization, Pearlson cautions that deployment of mobile technology necessitates significant change management. Organizations should first consider the impact on individuals and, secondarily, the effect on individual departments and on the entire enterprise. Ultimately, Pearlson said, portable technology should be the basis for redesigning the entire process of delivering customer service.

Some companies are already heading in this direction. Since July 1992, Conrail's Philadelphia division has used pen-based notebook computers from GRiD Systems Corp. with radio communications for a freight-management application. "Our focus was on improving the quality of our services by delivering real-time data to our local train crews," said Jerry Conway, a systems manager in the in-

The Right Chemistry

.....
Nalco Chemical's notebook computers make it easy to demonstrate the ROI of doing business with the company

The Nalco Chemical Co. has a tradition of providing more than just specialty chemicals to its customers. Beginning in the 1920s, the Naperville, Ill.-based firm equipped its field-sales representatives with portable chemical-test kits. The idea was to perform on-site analyses of water samples in order to recommend appropriate treatments.

Nalco's customer-service goals haven't changed over the years, but the technology it uses to achieve

them has. The \$1.3 billion company, which sells water-treatment, petroleum and process chemicals worldwide, has equipped nearly half of its 1,500-member domestic sales force with either Compaq or IBM 386-based notebooks and portable Canon printers. The notebooks are installed with Lotus 1-2-3, Harvard Graphics, WordPerfect, the PC Tools utility package and a series of technical programs written in-house.

"With the notebooks, we can sit down with customers and demonstrate the costs and benefits of doing business with us," said Mark Lega, director of information systems. Through a series of interactive modeling programs, salespeople can develop a complete chemical-treatment solution, from selecting the best product to factoring in the costs of energy consumption, water usage and waste treatment. Salespeople can also use the notebooks to collect data on flow rates and water-sample readings from special tracking equipment and to check that information against control limits by accessing real-time

data at headquarters via modem.

A key goal for the N-COMPAS (Nalco Computer Assisted Services) system was to save salespeople from having to connect to the corporate mainframe during their normal routines. Previously, salespeople using portable terminals had to find a phone line and dial into the mainframe to run some of the technical programs.

Recently, an independent consultant found that more than half of Nalco customers surveyed cited N-COMPAS as a significant reason for doing business with the company. "We can call on customers, open up a notebook, go through the entire selection process and show them their ROI when they select Nalco," said Lega.

Eventually, N-COMPAS will be rolled out to all salespeople and provide access to information collected from district offices, headquarters and field workers. "We're now working on the networking piece, which will tie everything together, including all the facilities where we have equipment," Lega said.

—M. Santosus

formation systems department at Conrail's headquarters, also in Philadelphia. (Local service involves deliveries between a customer's own train siding and a regional train terminal within a 50-mile radius.)

Linked by a RAM Mobile Data network service, 70 locomotives are equipped with notebook computers and radios to receive information on schedules, pricing, shipment status, arrival times and billing. This work-order information is downloaded from the central IBM 3090 mainframe to workers on the trains, who need only tap their screens with the computer pens to receive and transmit information. Before Conrail started using the notebooks, workers in transit had no way of knowing about changes in orders until the ends of their shifts, as much as 12 hours later. Now, if an order is changed during the course of a shipment (for example, if an additional pickup or drop-off point is required), someone on the train can be notified and the changes accommodated.

"We looked at the pen-based system as a quality-control project," Conway said. "By focusing on real-time data, we've enabled train crews to respond to customers quickly."

Rochester Gas & Electric (RG&E) in Rochester, N.Y., uses IBM's PCradio wireless communications system for its gas services division. Handheld DOS-based devices are installed in 50 service vehicles, allowing two-way voice and data communications between field workers and employees at headquarters receiving service requests from customers. The mobile devices communicate via radio directly to an OS/2-based LAN connected to an IBM 3090 at headquarters.

Previously, field workers received their orders on paper at the beginning of their shifts. Additional instructions were relayed over a voice radio, which required field workers to write down the information. According to Gary Dunkleberger, the department manager of information systems customer support, integrating

communications with mobile technology has enabled RG&E to improve service response time to customers as well as to provide both customers and management with accurate status reports. In addition, much more detailed customer information, such as the location of a house key or the presence of an unfriendly dog, is gathered and entered into the system. "Managers can monitor and redirect the work that's being done," Dunkleberger said. "[And] by balancing out the workload, we've been able to minimize overtime."

Despite these benefits, deploying the mobile devices has not been problem-free. Dunkleberger reports that RG&E's existing communications network has geographic and capacity limits. "We have some concern getting messages out to the vehicles," he said. "We knew this would happen, but we didn't want to invest in a new radio network." Instead, RG&E is evaluating RF network providers such as ARDIS, as well as developments in packet cellular technology. Still, Dunkleberger hopes that 200 vehicles will be equipped with radio systems by the end of 1994.

SALESPEOPLE IN THE FIELD ARE still the predominant users of mobile computers, but that's starting to change. "There are exciting changes in notebooks that are going to advance the concept of the virtual office," predicted Tom Miller, vice president of home office research

"There are exciting changes in notebooks that are going to advance the concept of the virtual office."

-Tom Miller

for LINK Resources Inc. in New York. Miller sees the combination of mobile technology and communications as key to creating more-flexible companies.

Customer-service and marketing professionals are particularly well-positioned to exploit the technology, according to Miller. Equipped with notebooks that can communicate anywhere, they can set up an "office" wherever their customers are located. All product and customer information will either be stored on their portable machines or accessible from central databases in real time.

"As the technology gets smaller, cheaper and smarter, adopting [notebooks] will be all the easier," Miller said. "The companies that figure out how to exploit the benefits of mobile technology are going to strengthen their competitive positions."

Trav Waltrip shares those sentiments, and he is positioning The Travelers Companies in Hartford, Conn., to be among the winners. The vice president of telecommunications is working with a planning group to identify mobile-technology candidates throughout the company. The group is reviewing each line of business to determine which professionals must remain deskbound because they depend on LAN bandwidth to perform their jobs. The applications these individuals use are too complex to allow them to adopt notebooks as their primary platform. But the majority of professionals who don't wrestle with complex, information-intensive applications are potential users of mobile technology.

Speaking in general terms (rather than about anything specific that Travelers is doing), Waltrip said that "all the large corporations in the U.S. are restructuring and will have fewer white-collar workers. The emphasis will then be on how to maximize productivity." Freeing those remaining from their desks is one way to achieve this.

Some Travelers auditors already use notebooks (and can exchange information with a host via dial-up ca-



pabilities) when they visit with independent insurance agents. While notebooks are used on a limited basis now, Waltrip wants to be prepared when wireless communications becomes a business imperative. "These developments are going to totally change how professionals in the U.S. work," he said. Most importantly, they will be able to make better independent decisions and prioritize work for maximum results.

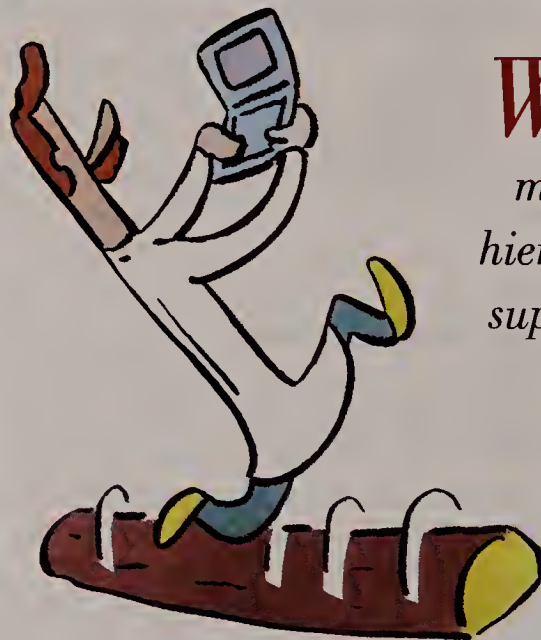
But Waltrip also foresees a major shift in management philosophy, from hierarchical structures toward less supervision and increased worker independence. "At the moment, the change in philosophy isn't keeping up with the technical changes," Waltrip said. "The philosophy is going to have to change anyway for reasons of competitiveness, and mobile technology is the enabler."

HOWARD SCHWARTZ, PRESIDENT and CEO of Lynch, Jones & Ryan, has been sold on portable computing since his company first got laptops in 1987. At that time, he was in charge of a startup division of the company, an institutional broker based in New York. The first laptops were installed with SNAP, a sales-automation program from Sales Technologies Inc., and deployed to sales and marketing staff. "We looked at it as a productivity-enhancement tool," said Schwartz.

Today, 15 remote salespeople are equipped with Compaq 486 notebooks with internal modems, cc:Mail and WordPerfect. SNAP has been extended throughout every department that has contact with clients, including an executive group, senior sales management, client services and trading. "Communication was the motivation," said Schwartz. "We didn't want our salespeople to be out of contact." A Novell LAN linking NeXT 486s and some 286s slated for replacement runs at headquarters. Salespeople at remote locations have around-the-clock dial-in capabilities to access corporate databases. SNAP monitors all sales activities within a territory, including sales calls, letters and meals. "Any contact with a

client is incorporated into the system," Schwartz explained. "These contacts are the leading indicators of productivity, and we're able to better monitor all the activities between the first sales call and when the first business is generated."

The biggest benefit, according to Schwartz, has been increased productivity, thanks to the elimination of



most paper-based activities. The system maintains the vital statistics for 4,000 plan sponsors and 10,000 institutional money-management firms. It also serves as the central source for all sales prospecting. The salespeople write correspondence on WordPerfect and electronically send the files to New York, where support personnel produce and send out the finished product. As a result, the company has been able to reduce support staff while cross-training employees in multiple functions. Since SNAP captures all the contact information, salespeople no longer have to produce monthly reports and can spend the bulk of their time on sales activities.

"Having the ability to harness both desktops and notebooks is essential to maintaining a competitive edge and promoting a sense of unity within the company as we look to expand globally," Schwartz said.

As vice president and director of MIS for the Foothill Group Inc., a financial-services company based in Los Angeles that specializes in commercial lending and asset management, Scott Thomas recently oversaw an upgrade to Texas Instruments'

Travelmate 486 notebooks with internal modems. About 20 field auditors use the machines to collect data at customer sites and send it via modem to a special bulletin board for review by portfolio and audit managers. Previously, auditors had to manually fill out reports and fax them to the office, where the data was entered into the system for review.

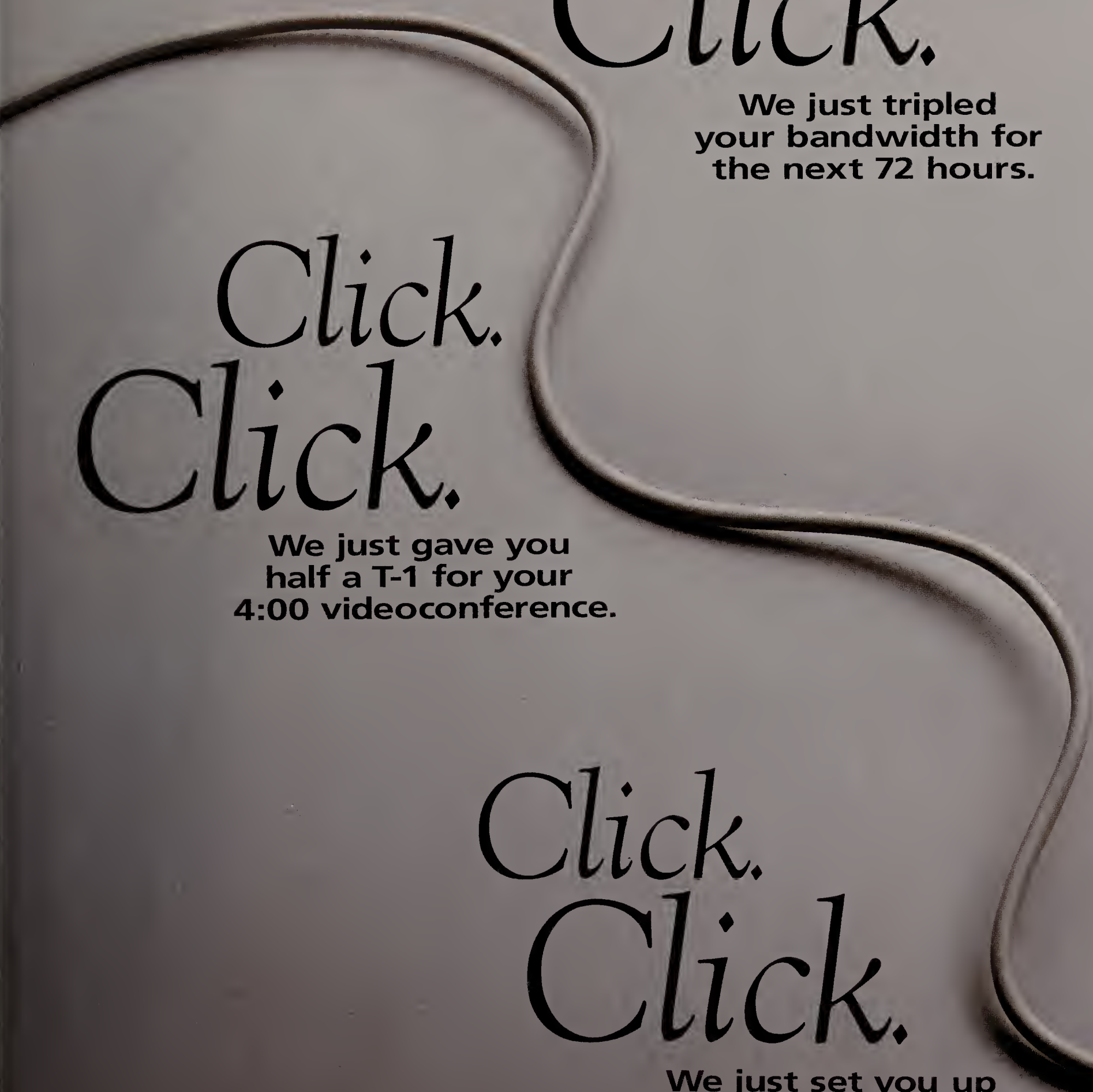
Waltrip foresees a major shift in management philosophy, from hierarchical structures toward less supervision and increased worker independence.

This method was slow and error-prone because data had to be entered twice.

Armed with customized analysis tools, auditors can now perform complex calculations and financial analysis on-site. "With the tools, we're able to make better business decisions because we can notice trends quickly," Thomas said.

The notebooks allow auditors to leverage information that they otherwise wouldn't have the time or power to use. "Our industry is based on what our customers are doing," Thomas said. "It's extremely important that our auditors gather current information and report it in a timely manner." Since adopting remote technology, Foothill has increased caseloads by 250 percent while reducing staff size.

Clearly, some organizations have already realized the strategic benefits of going portable. The tools and machines now available are not just for automating the tasks of people who always worked remotely. "Mobile technology will do more than increase the productivity of professionals," said The Travelers' Waltrip. "With mobile technology and wireless communications, new groups of professionals can be freed from the confines of an office and can become knowledge workers." □



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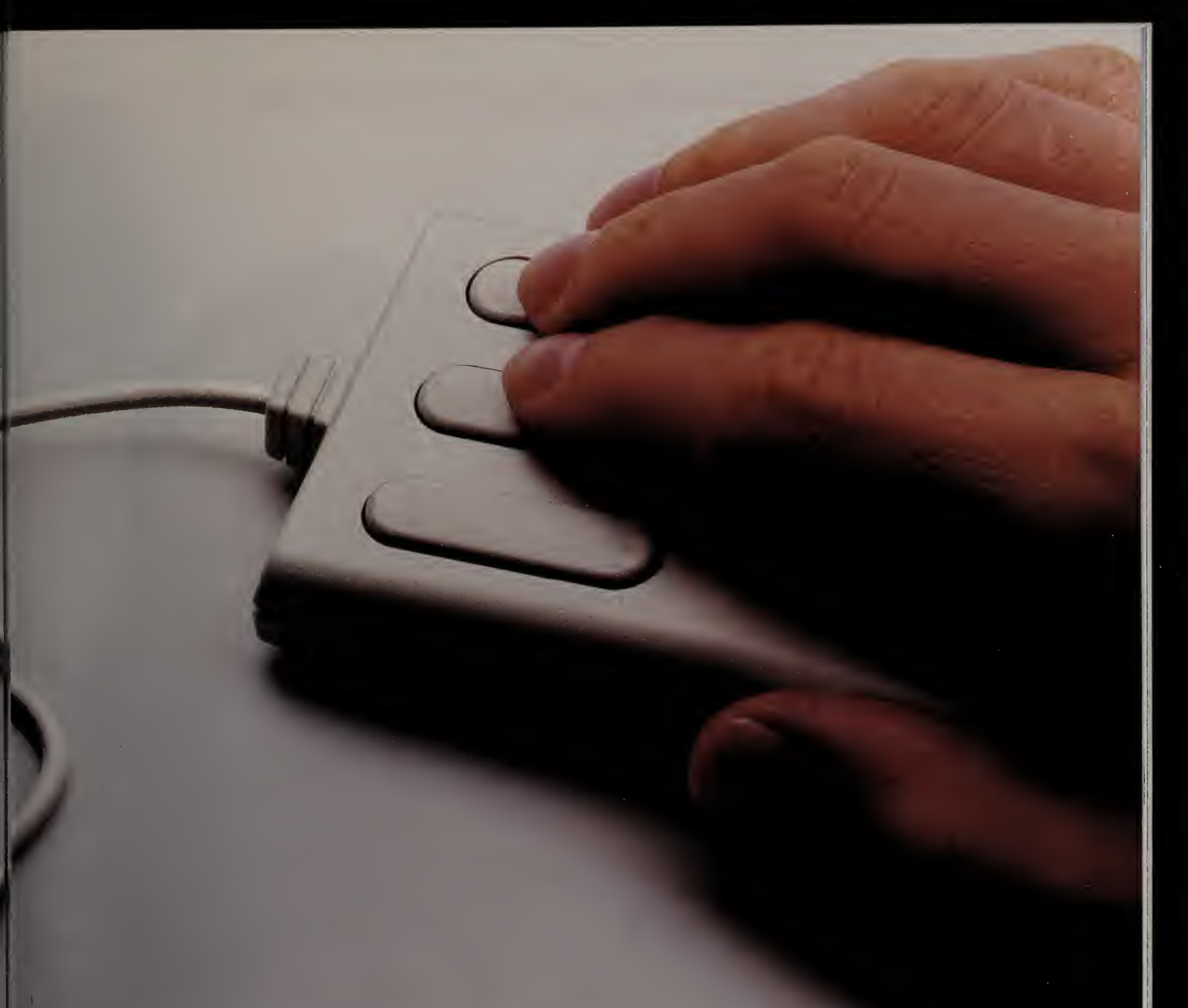
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A close-up, slightly low-angle shot of a man with dark hair, smiling. He is wearing a white dress shirt and a dark tie. The background is out of focus, showing a large, curved, metallic industrial structure, possibly part of a power plant or refinery, under a bright sky.

DAVID MARLEY:

"We had to assure the public and the NRC that Unit 1 was safe and that we were qualified to run it. Part of that assurance was proving that we could provide better information to the control-room operators."

AN INFORMATION POWERHOUSE

Without doubt, poor information flow contributed to the 1979 accident at Three Mile Island. Now the nuclear facility is a model for the effective collection, analysis and distribution of critical data.

BY LEIGH BUCHANAN

FOR MANY PEOPLE, Three Mile Island is not a place but an event—the sudden awakening of a nation grown complacent in its scientific mastery to the realization that technology is not always benign. But 14 years after a stuck valve caused extensive damage to one reactor's core—and to the public's perception of nuclear energy—Three Mile Island has undergone a sea change. Once near bankruptcy, the company has returned to solid profitability. In 1991, it set a world record for the longest continuous run without an automatic shutdown. And the Nuclear Regulatory Commission has ranked TMI as one of the best nuclear plants in the country for operational performance. The agent for much of this change, not surprisingly, has been technology.

A “remember the Alamo” spirit pervades the sprawling campus of half-empty trailers and bleak office buildings located about 10 miles south of Harrisburg, Pa. While the plumes of water vapor billowing from Unit 1 attest to a return to normalcy, the brooding towers of Unit 2, scheduled to enter long-term “monitored storage” in August, are a stark reminder of the past. Everywhere you go here, people refer to the accident in terms approaching the Fall. And like mankind after the Fall, what TMI gained from its experience is knowledge.

“The accident was a watershed event, and the fundamental lesson was to be prepared for and train for the unexpected,” said David Marley, client services director for IS at GPU Nuclear Corp.,

PHOTOGRAPHY BY JACK VAN ANTWERP



BILL MCSORLEY: *The new handhelds will improve safety and efficiency.*

the Parsippany, N.J.-based company that was formed after the accident to operate Unit 1 and oversee the cleanup of Unit 2.

Before the formation of GPU Nuclear, the TMI plants had been operated directly by Metropolitan Edison Co., headquartered in Reading, Pa. (Metropolitan Edison still owns 50 percent of TMI-1.) "There were a few chairmen back then whom I believe were not really very pro-IT," said Marley, who joined the organization in 1982, after working for General Dynamics and Sun Co.

As a result, information flow in the plants was poor, a situation that contributed significantly to the events of March 28, 1979. In the hours just before dawn, water used to cool the nuclear core flowed out of the plant's reactor-coolant system through a stuck valve; the core overheated and was destroyed. Operators on duty at the time were suddenly deluged with

information. With paper printouts flooding in half an hour after the events they recorded, control-room staff soon confronted a bottleneck of data. Alarms were going off everywhere, but because they were not prioritized, operators had no idea what to respond to first.

Because poor layout and a confusing labeling of instruments contributed to the accident, the control room has since been "human engineered" to provide operators with intelligible, reliable information.

Although the damage was limited to Unit 2, Unit 1, which has the same design, was forced to shut down for six-and-a-half years while modifications were made and pending the outcome of extensive hearings. "We

had to assure the public and the NRC that [Unit 1] was safe and that we were qualified to run it," Marley said. "Part of that assurance was proving that we could provide better information to the [control-room] operators."

TMI's control tower is an oasis of light and relative quiet, separated from the darkness and din of the turbine building by fire- and radiation-proof lead doors. Like doctors monitoring a patient, control-room operators must be able to constantly track both vital signs and the—less obvious—symptoms of distress. Because poor layout and a confusing labeling of instruments contributed to the accident, the control room has since been "human engineered" to provide operators with more intelligible, reliable information. Today, members of a beefed-up control-room staff hover over high-speed color-display monitors and instrumentation panels that have been newly demarcated to show normal ranges. Alarms connected to the emergency feedwater system, turbine and other critical equipment blink in red, yellow and green on monitors that span the top of the room: The color coding allows operators to respond to the most serious problems first.

Most of these modifications were made by groups of engineers and others outside of IS, including the Plant Process Control (PPC) group, which is responsible for the opera-

tion and maintenance of TMI's central computer. But as the Unit 2 cleanup progressed and Unit 1 was being returned to full power, "GPU recognized that information technology was going to be important to

TMI's comeback," Marley said. Deficiencies outside of the control room became increasingly pressing, and a flurry of new projects emerged from the expanded IS organization, including systems for online radiation-exposure monitoring, maintenance and work management.

"Before the accident, IS concentrated on the administrative and busi-

The system automatically updates up to 1,000 of the 3,500 data points it tracks every three minutes. This information can be displayed in tabular or graphic form on any PC connected to the company's LAN and exported to various applications for more detailed analysis.

ness side of the company," said Marley. "There was very little effort devoted to improving plant conditions or [to] our bread and butter, generating electricity. Now we invest most of our resources on the nuclear and generation side."

Once Unit 1 returned to operation in 1985, Marley turned IS's attention to improving communication within TMI, as well as with GPU Nuclear's headquarters in Parsippany and the company's Oyster Creek nuclear plant near Toms River, N.J. "We had these very pressing communication needs, and yet GPU had only 150 PCs, and none of them were linked," said Marley. "What we needed to do was pull everything together."

In 1988, IS began replacing the company's standalone PCs with IBM

PS/2s connected via local and wide area networks. In addition to providing a more versatile platform, the project saves GPU Nuclear \$600,000 a year, according to Marley. "GPU took about half of those savings and let me invest the other half in video-conferencing and new phone switches," he said. The company also "gave me a million dollars on a handshake to buy PCs for the people in the company that didn't have them."

of PCs, the IS chief saw an opportunity to create a real-time, easily accessible repository of information that would greatly improve employees' up-to-the-minute knowledge of plant operations and allow them to do historical and trend analysis at their desktops. Sponsored on the business side by a former vice president at the Oyster Creek plant, where a less sophisticated version is now running, the Plant Performance Moni-



MIKE VITALE wrote the Operator Tour system to facilitate information-gathering in the plant.

Networking the office buildings posed no problems, but the plant sites were tough. "We had to design fiber networks, both because of the need for capacity and because fiber is immune to the electrical interference you get in a nuclear power plant," said Marley. "Radiation can also literally degrade copper wire."

The company's most recent investment is a system of which Marley is especially proud. With the LAN in place and the infusion

toring (PPM) system captures information from the central computer (an Encore Concept 32 running Gould's proprietary MPX32 operating system), which is hard-wired to thousands of instruments throughout the plant. Such data had previously been available only through hard-copy reports or via dedicated terminals.

Developed in conjunction with the PPC group, the PPM automatically updates up to 1,000 of the 3,500 data points it tracks every three min-

utes—measurements of temperatures, pressures, water flows and other indications of the plant's health and status. This information can be displayed in tabular or graphic form on any PC connected to the company's LAN and exported to applications such as Lotus 1-2-3 and dBase for more detailed analysis.

"You normally have some problems getting these things online," said Bill Frank, an analyst in the PPC group who worked on the system. "But this has been running without a hiccup."

"The more information that is out there about the plant, and the easier it is for people to get it and ma-

information has always been gathered by the [central] computer, but up until now it was never easily available on PCs," said Bob Masoero, plant performance engineer in the plant-analysis group. "The [central] computer only has the last 10 or 15 days of information, whereas this system can give you up to a year. If I've got something changing slowly over an extended period, it's a much better tool."

Under the old system, data from the central computer was transferred to magnetic tape and mailed or driven 50 miles to Reading, where it was loaded on the company's Amdahl mainframe. When someone re-

problems are historically and what we can do to solve them," he said.

The PPM has had little direct impact on operations in the control room, where terminals receive information directly from the central computer. But shift technical supervisors—engineering experts who rotate in and out of the control room—have found the system frees them up to concentrate on their work. "People outside the plant used to call me up

The central computer only has the last 10 or 15 days of information, whereas this system can give you up to a year. If I've got something changing slowly over an extended period, it's a much better tool."

—Bob Masoero

[while I was on duty] and ask me for plant data," said Shift Technical Adviser John Tesmer. "Now they can get the information themselves, and I can spend my time on things that I'm interested in."

According to Marley, the company expects to gain additional value from the PPM by selling it to other organizations. He has already fielded a number of inquiries from utilities and other companies interested in using the system to help manage large, process-related activities.

While the IS group's recent emphasis has been on getting information out to users in disparate parts of the company, "directing our technology, reengineering and automation [efforts] to the plant sites" remains a top priority, according to Marley. One problem the organization faced was how to improve the speed and accuracy with which da-

Technical Profile

Three Mile Island Unit 1 is a pressurized-water reactor producing over 870 megawatts of electricity—enough to supply approximately 500,000 homes. It is operated by GPU Nuclear Corp., based in Parsippany, N.J. GPU Nuclear is a subsidiary of the General Public Utilities (GPU) Corp., one of the 20 largest investor-owned electric utilities in the country, with 1991 revenues of \$3.4 billion.

Large and Mid-Range Systems: GPU Corp.'s two mainframes, an Amdahl 5990-1440 and a 5990-1100, are located in Reading, Pa. The plant's central computer is an Encore (formerly Gould) Concept 32, Model 9780, running Gould's proprietary MPX32 operating system.

End-User Computing: GPU Nuclear has more than 2,000 IBM PS/2 workstations. The Operator Tour system uses 24 handheld computers from DAP Technologies.

Software: The main components of GPU Nuclear's software suite include Lotus Development Corp.'s Lotus 1-2-3, Lotus Notes and Freelance Plus (graphics design); WordPerfect Corp.'s WordPerfect; Microsoft's FoxPro (database management); Trellis' Tackboard (bulletin board); Software Publishing Corp.'s Harvard Graphics, and Concentric Computing's R&R Report Writer. The PPM was developed using Microsoft's C and Computer Associates' Clipper.

Networking: GPU Nuclear recently installed a Banyan Vines LAN based on an IBM token-ring topology.

nipulate it in a timely fashion, the better for safety and effectiveness," said Hersel Ahdout, an IS technical consultant who wrote the software and developed the communications interface. "Sometimes in this industry it is crucial to break information down to the second, and this system makes that possible."

The PPM stores data in four-hour "snapshots," creating an online history of plant operations. "Historical

requested information more than a few weeks old, it had to be retrieved from the mainframe and reformatted, a process that usually took about three days.

Masoero expects the PPM will be especially valuable to engineers doing long-term analyses to determine how and whether to try to extend the life of the plant, which is scheduled for decommissioning in 2014. "It will help us assess where the

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loss of control • user rebellion
redundant procedures • manual errors
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BILL FRANK: *The Plant Performance Monitor has been running "without a hiccup."*

ta was gathered from the thousands of instruments that had never been wired into the central computer. The solution, a system called Operator Tour, equips the operators who patrol the plant each shift with handheld computers.

The difficulty of rapidly gathering precise data in a nuclear-plant environment is evident to anyone visiting the TMI-1 turbine building: a vast, shadowy maze of pumps, sumps and tanks separated from the reactor building by four-foot-thick walls. Operators, their ears plugged against the unrelenting roar of machinery, walk from instrument to instrument, recording a pressure here, a water level there. Once assisted only by clipboards, they now use the handhelds to help them check the operability of equipment, record data and perform certain tasks.

Four or five operators per shift use the handhelds to scan in bar codes attached to approximately 1,000 pieces of equipment: The system identifies the instrument, informs the operator of his or her task and supplies parameters for the reading. If

the reading is acceptable, the operator moves on. But if, for example, an oil level is low, the operator can call up a help screen to find out what type of oil should be added and how much. The system also allows operators to store comments and access the comments or readings of operators on previous shifts. Even-

If poor information flow made the accident at Unit 2 a probability, inadequate training made it almost inevitable.

tually, all 30,000 plant components will be bar-coded, according to Marley.

The handhelds, from DAP Technologies, use the same interface as the PPM. When operators return to the control room, the information is uploaded, reviewed and then stored

where the PPM can access it and make it immediately available to users throughout the company.

Systems Engineer Bill McSorley, who helped develop Operator Tour, said the handhelds will improve safety and efficiency by providing operators with more information in less time and by making that data available to others as part of a central repository of plant data. And the units have another advantage over paper, he explained: "If they are contaminated with radioactive material, they can be decontaminated easily with soap, water and a brush."

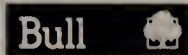
If poor information flow made the accident at Unit 2 a probability, inadequate training made it almost inevitable. For that reason, the money and energy invested in new technology has been matched in TMI's revamped operator-education program. Following the accident, the company enlarged its training staff from seven to 55 and created a full-scale, completely operational replica of the control room in a new building near the plant. The simulator runs all systems in use at the plant, including the PPM; its original \$18 million price tag has risen to nearly \$25 million as additions have been made to keep it current.

From a booth on one side of the training room, the instructor throws out challenges great and small: The simulator can handle anything up to and including fire and flood (although not earthquake, but "we're not in earthquake country," one employee explained). Video cameras mounted in the ceiling record the exercises, and trainees use the tapes to evaluate how well they responded as a team.

"The training is at least as important as anything we do here," said Marley. "Technology is really only a support for the people who run the plant. We have more people now, and we're giving them a better understanding of how everything works and more information at their fingertips. We've come 180 degrees from where we were back then." CIO

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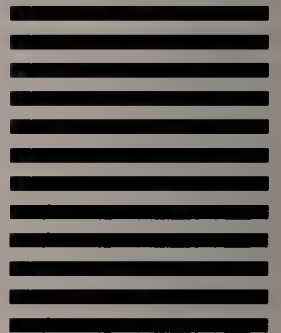
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LOOKING FOR A FEW GOOD READS

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When CIOs pass
judgment on the
value of the business
and trade press, the
verdict is clear: They
can't live with us
and can't live
without us...

BY TOM VANNAH

ED MCDONALD reads constantly, at least five hours a day. Without the insights gleaned from this demanding regimen, he doubts he'd be able to do his job. For McDonald, who is second in command in IS at Houston-based Texaco, being well-read is a defining characteristic of his information executive role. Yes, he is a technologist, but he's also a businessman and manager. Each piece of the job demands his close attention, and none can be ignored.

Water, Water, Everywhere...

.....
But when you need a particular drop or two to
drink, it's nowhere to be found

Quite apart from the question of whether the press gives its readers enough of the right stuff, there's a further concern about whether the stuff is accessible in the right form at the right time to deliver the maximum benefit. After all, if a reader suddenly needs information about new warehousing technologies, the elusive fact that Modern Warehouse Management Trends Monthly devoted an entire issue to the subject three months ago can easily go undiscovered.

"There is an information glut," said Ed McDonald, assistant general manager of IT at Texaco in Houston. The irony is that even amid all that information you may stand little chance of finding just what you're looking for. "The thing you need to know is probably in print somewhere, but you need to find it in time to use it," said McDonald. "That's a problem."

One solution could lie in auxiliary means of delivering information. Gene Bloom, director of technical services for the Federal National Mortgage Association (FannieMae) in Washington, wishes more publishers offered online resources such as bulletin boards featuring electronic archives, summaries and indexes. "I'd like to be able to pull up 10 to 15 articles [on a particular topic] in a couple of minutes," he said.

Very little of what Bloom reads is immediately useful. So he tries to maintain a library of back issues of certain titles—a tactic too cumbersome to apply with any regularity. "As it stands now," he said, "I'd probably have to make a decision [without finding] what I want."

Besides the torrent of hardcopy McDonald wades through every week, he has a newswire service on his desk. The World Oil Watch, or WOW, is an online news database fed by Dow-Jones, Knight-Ridder, Platt's Global Alert and other news services. To a degree, WOW can be customized; McDonald can select a series of key words that appear frequently in the headlines that are important to him. His online news is filtered, doing a lot of the scanning for him.

It's far from perfect, though. He looks forward to the morning he wakes up and finds The Ed McDonald News on his breakfast table. It won't be a paper journal, and he will miss the aromatic blend of newsprint and coffee. But he envisions something much more useful: an online, AI-based just-in-time news report tailored to his specific needs. It would allow him to roam interactively through varying degrees of detailed background and analysis, with CD-ROM technology opening vast libraries to him.

—T. Vannah

Thus his hunger for current news draws on three basic informational food groups: world affairs, technology and business management. He takes several newspapers to work each morning and lugs home a heavy briefcase of magazines at night. "And my boss reads more than I do, I am

quite sure," he added, formal in acknowledging that rank has its greater responsibilities.

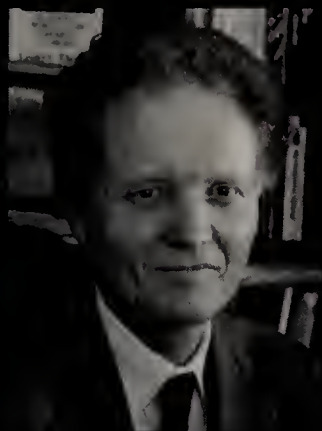
McDonald is not alone in his appetite for the latest scoop. Paul Simone, vice president of Technological Services at Travelers Insurance Corp. in Hartford, also frames the need to stay well-informed as a CIO survival issue. He links the profession's high mortality rate to a limited diet: too many technology publications and too little of everything else. In the end, he said, CIOs rarely fail because they lack insight into technology. "They are usually just [lousy] businessmen," he said. "They don't keep up with the world outside the computer room."

But when it comes to consuming information, seeking it wisely and getting real nourishment from it can be two different things. One reason CIOs have to read so much is that there is so damn much to read. No single publication can supply all the information an executive needs. And while some—The Wall Street Journal is a frequently mentioned example—may come close to being indispensable, many other publications fall into what McDonald calls the "me-too syndrome." The marketplace is awash with duplicated reporting, perhaps fashioned with a particular readership constituency in mind but offering very little that isn't found in dozens of other journals. Loath to miss the one exclusive nugget nestled within a duplicative hash, however, CIOs may scan dozens of similar magazines.

Many executives insist that this is nowhere more in evidence than in magazines that cover technology. "There is simply too much print about technology news, and much of it is redundant," said Richard Kesner, CIO at Babson College in Wellesley, Mass. By the time he's done with his six or eight technology trade magazines, Kesner often feels that he has read the same news several times.

Familiarity breeds contempt, according to Horace Gower, vice president of information services at L.L. Bean in Freeport, Maine. "They all come across my desk," he said. "I'm deluged with the techy stuff. Most

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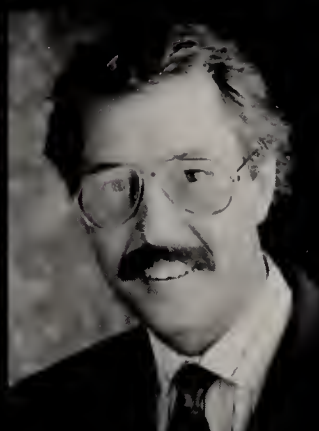
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*When it comes
to consuming
information, seeking it
wisely and getting real
nourishment from it
can be two different
things. One reason
CIOs have to read so
much is that there is so
damn much to read.*

.....

[magazines] I give a real quick glance and then I chuck them. With most, I find myself asking, 'What's new? Where's the value for me?' I scan the table of contents for an article or two that strike my fancy, but in some cases it only takes 30 seconds for a magazine to pass my desk."

While Gower acknowledged that some duplication in straight news reporting is to be expected, he believes that staleness invades even the purportedly more reflective features of trade publications. With topics such as "the most important characteristics of a CIO," he said, "you'll see the same sort of thing in eight different publications." It's not that they're invalid, just repetitive.

This tendency can be more than simply tedious, however. It can foster what McDonald sees as the spread of cant. Merely through repetition—and not necessarily by merit—ideas gain unearned legitimacy that too few journalists are willing to question. McDonald nominated corporate downsizing as his favorite recent dead horse. "There has been a huge amount of information on [the reason] people are doing it. But, eventually, much of it was based on so-called conventional wisdom that hadn't been properly challenged."

Patricia Wallington, vice president and CIO at Xerox Corp. in Stamford, Conn., goes a bit further. Not only does she fault the press for failing to ask the hard questions in the stories it reports; she believes it may be missing some stories entirely. "For years we've heard that we've invested in technology without seeing any gains," she said. "But now, nobody is asking whether the current surge in productivity due to downsizing would have been possible without the earlier investments in IS. I don't see anybody linking them. Maybe they don't link, but I think it's worth investigating."

Simeone has all but forsaken most trade publications, which he believes too readily—and too uncritically—make themselves available for promotional manipulation. It's not just the touting of products, he said. "You see profiles, usually of executives in

big corporations, that are mainly bullshit and pontification. You've heard most of it before. I think they're looking for publicity. Magazines become a forum to sell yourself." Instead of the trades, Simeone now relies on the technical supplement in the Wednesday editions of *The Wall Street Journal*.

Lest this begin to seem like a trade-pub-bashing session, most of the executives interviewed for this article listed a few technology journals as "must" reading. But they also thought that too few publications are aimed at executives—and even fewer at IS executives.

It's a question of depth, according to Kesner. There *are* good publications, he said, but most are either ponderously academic or "popular." For Kesner, that means too much fluff and too little meat. Publications "slide into a sound-bite mentality and end up lacking in substance. They don't always research a topic very well. You'll read that XYZ company is doing great things with a product, and come to find they haven't [yet] taken it out of the shrink-wrap."

Better, though, to be light than to be academic, Kesner added. "I have no patience whatsoever with the purely academic publications written by Ph.D.s in MIS—a meaningless degree, in my opinion. Academics haven't had to manage anything. They're too removed, and they lose sight of the human element." Powerful stuff from a guy who works at a college with a business-oriented curriculum, but Kesner said he can't find a way to apply what he reads in academic journals. "It's either esoteric model-building—models for calculating a user's level of sophistication: 'Umm, let's see, you're a 4.8.' Or it's surveys up the ying-yang—what kind of CASE tools do the top companies use."

Kesner seeks some middle ground—"the *New Yorker* of MIS"—where he can find greater integration among technology, business and management. That is the stuff for CIOs.

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Gower wants case studies that will let him know in concrete terms what happens to an organization, and to its IS department, when it first implements a new technology.

.....

Wallington, however, says that this integration is already taking place in the press, now that general business magazines have come to recognize the strategic importance of IT. However, she thinks that the product-oriented technology publications have done less well at weaving in the business issues that bear upon technology use.

Wallington believes the well-rounded technology practitioner badly needs this sort of integrated, full-context information. At Xerox, fledgling IS professionals are encouraged to look at the broader business perspective. "I think they're happy to do it," she said. "Young people in this business don't want to be trapped in a techy job."

So IS executives read what any smart businessperson would read. "Volumes, volumes and volumes," she sighed. She described her own reading appetites: "Lots of business reading, some competitive types of things to keep up with what Xerox's competition is doing, and occasionally something more technical. I scan across some of the technical magazines."

But improvements in the way the press integrates technology and business issues haven't filled the gaps to everyone's satisfaction. Gower, for one, wants to know in concrete terms what happens to an organization, and to its IS department, when it first implements a new technology. This is where the press largely falls down, he believes. He can read about various products in great detail. He can delve into academic treatments of a particular technology. But he can't readily find a case study, with the results carefully documented and with the organizational impact described, to help him decide how best to use that technology in Freeport.

"If I had read a success story or two, how a company applied the technology and how they got results, I'd know a lot more. With technology stories there are three questions: What is it? How do you use it? And what's its business application?" Most journals can manage one satisfactorily, but very few answer all three, he said.

"Current CIOs are usually old-time

techies; they need enough technical insight in what they're reading to make their blood tingle," Gower said. Many publications, he suspects, play upon this vestigial reflex in writing about new technologies, and particularly in reviewing products. They use technical hype to disguise a lack of depth, he said. "I can read at length about a new technology, learn all about why it works, but they never tell you how to use it or how to support it," he said. His blood may be tingling, but his central business questions about costs and benefits go unanswered. "I guess the question is: How deep can an article go without being boring?"

Kesner turned Gower's question around: "The conundrum [journalists] face is how to make it sexy but realistic." He holds a lack of realism—and a scarcity of the sort of "bad news" dimension that adds to a story's credibility—chiefly responsible for the unjustified expectations that often burden IS executives.

"Users see an article in a magazine, turn to the CIO and say, 'This is what I want, and you can do it in a couple of weeks.'" The CIO then has the problem of shooting down those high-flying expectations and filling in the many blanks between the user's dream and the implemented reality—a process that can sometimes add to the IS group's reputation, whether deserved or not, for unresponsiveness.

But complaints that the press carelessly heightens expectations or ignores the complexities can be seen another way. After all, most reporters and editors are eager to examine the details of instructive failures. The conspicuous absence of such "full" reports might suggest that executives aren't always completely forthcoming when the news of their exploits is less-than rosy.

IS executives may long for a single dependable road map offering precise directions to safety, but perhaps the best the press can offer them is a higher vantage from which to get their bearings. [CIO]

Tom Vannah is a freelance writer based in Boston.



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A New Lease on Licensing

Traditional software licenses do not take into account the use of various platforms and machines required for distributed computing. Now vendors and users are working to develop new types of agreements.

BY KATHLEEN MELYMUKA

Software licenses have traditionally been linked to the number of machines or users involved or, in larger systems, CPU size. But client/server and interenterprise computing, as well as the increase in multimachine users, have made the matter of licensing anything but clear-cut. New models for licensing software are needed if users are to be able to take full advantage of technology within evolving architectures.

In the old days, most off-the-shelf software was licensed to a machine or a user. With a machine license, a company with 50 PCs bought 50 copies of a program. With a user license, a company with 100 people using a particular package bought 100 copies of the software. Simple. Today's shrink-wrap users run their software on increasingly complex networks, however, where the sharp focus of user and machine licenses blurs around the edges.

In large-systems operations, custom software licenses have traditionally been linked to CPU size. If

you used a big CPU, you paid a big fee; if you used a smaller CPU, you paid less. The license stipulated that you could run the software only on the specified-size CPU. If you needed to run it on a larger CPU, the vendor would charge an upgrade fee.

Increasingly, however, users of large-scale systems live in a distributed-processing world where making the most of technology virtually requires that platforms be mixed. "One of the basic concepts behind client/server is that you should be able to plug in any appropriate source of compute power or platform, invisible to the application," said Mary Welch, marketing manager for corporate business practices at Digital Equipment Corp. "If the application has to be licensed to a specific platform, then by definition you're inhibiting the full use of technology," said Welch, who is based in Nashua, N.H.

That's only the beginning. The old model of a relatively autonomous firm running a standalone set of applications is being replaced by a world in which not only departments but companies are networked together. Licensing in that new world will have to be profoundly different.

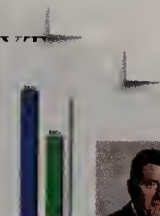
The industry is grappling with these problems on every level. In a 1992 survey by the Software Publishers Association, eight of the 12 large vendors interviewed were in the process of reviewing their licensing practices. Some recent innovations in off-the-shelf licenses address the basic question of whether a 100-user network requires 100 copies of a software package. Vendors have been softening the line on that issue by offering "license packs" or "LAN packs"—licenses for multiple users but with only one set of documentation and disks—at discounts of 20 percent and more.

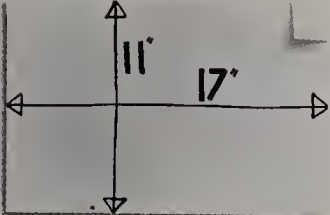
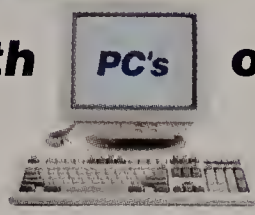


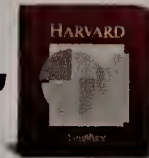
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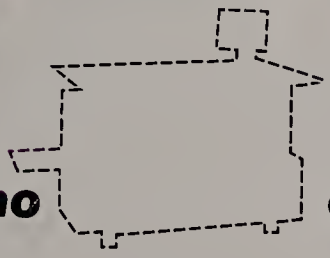
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An even newer arrangement, called concurrent licensing, goes further. Concurrent licensing is based not on the number of users or machines, but rather on the maximum number of copies of the software that will be in use at any one time. Called the "high-water mark," this is the number of licenses that must be purchased.

The term "in use" might not be as clear as it seems. Software that resides on a server to be shared on a network is not necessarily in use. Software that is loaded into RAM at a node, however, is in use. A copy stored on a user's hard drive generally is considered in use, regardless of whether it is actively being used. In concurrent licensing, a counting device works with the file server to permit the licensed number of users to access the program. The next person attempting to log on will be locked out.

Some publishers build lock-out mechanisms into their software; others leave the method to the customer. But any corporation with a concurrent license must agree to use some sort of counter and lock-out system. So while concurrent licensing reduces software costs to the corporation, it imposes the additional management burden of controlling and limiting access.

Another sign of the times is the proliferation of viewpoints about appropriate user rights and restrictions. Today's user might have a PC on his or her desk, another at home and another in a briefcase, all using the same programs for related work. By the old rules, a machine license required the user to purchase three packages of any program run on all three machines. A user license required the user to load and unload a single copy of the software as he or she moved from machine to machine, because copyright laws forbid the making of copies without permission.

Today, however, more and more vendors are relenting. Many licenses now include home-use and laptop extensions, allowing the user to pay for one program and make copies for all three machines. Vendor approaches to this type of license vary.

Most stipulate that only one copy be in use at any one time. Some require that no more than 20 percent of use be away from the primary computer. Some require a guarantee

While concurrent licensing reduces software costs to the corporation, it imposes the additional management burden of controlling and limiting access.

that there will be only one user for all PCs covered by the license. Others stipulate that if a single person uses the primary computer more than 80 percent of the time, that person may use the software on a laptop or home computer as well.

In the large-systems world, the CPU-based license is on the way out. Vendors and users are testing a number of approaches that intrude less upon the user's choice of architecture. DEC, for example, took a tentative step toward what it calls "decoupling" when it announced that users of its new 64-bit Alpha architecture will be eligible for licenses to run DEC applications within a given operating environment regardless of the hardware platform.

Decoupling begins to address the mix-and-match problems raised by distributed processing, but insiders predict that within a year or so, licenses for large-scale applications will be tied to neither hardware platforms nor operating environments. Rather, they'll be tied to some measure of capacity or use. Currently, some users who have very large volumes of business with a single vendor are testing software licenses based on the number of users, connections or transactions. These types of contracts are a lot tougher to set up than user li-

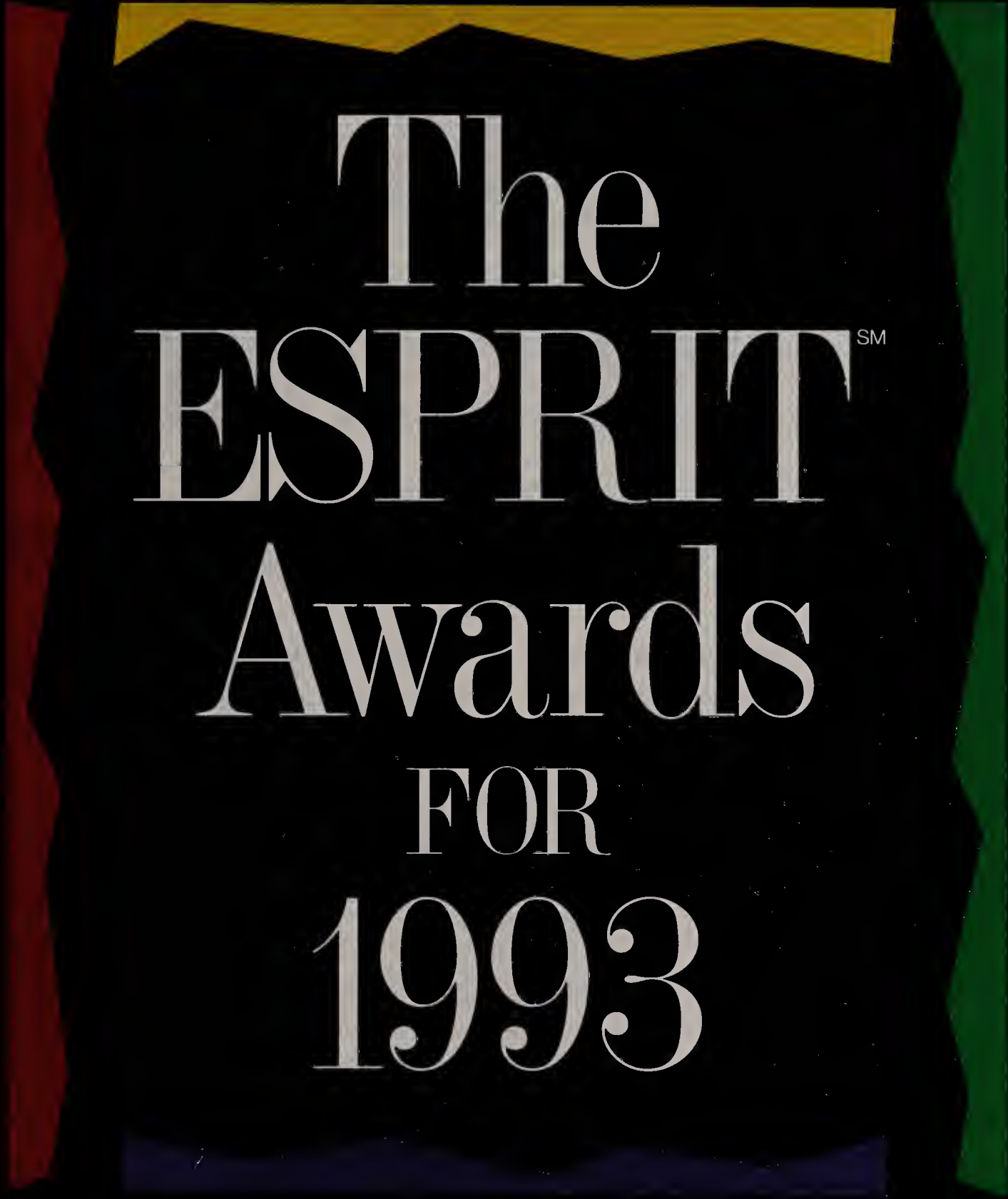
censes in the shrink-wrap world, however. They tend to be negotiated over time: Initially, the license is based on projections of how the application will be used, the number of transactions, the number of connections and so forth. Actual use is audited, and after a year, the parties renegotiate based on those findings.

Far more complex, however, are the questions raised by EDI and its natural evolution. Licensing models that resolve these questions will need to be hammered out during the coming decade. David Johnson, an attorney with the Washington-based firm of Wilmer, Cutler and Pickering, is grappling with these issues in his computer-law practice. EDI started as a very focused means of communication among buyers and sellers, Johnson said, but as it spreads and becomes more amorphous, large companies' systems are actually evolving into communications hubs. Corporations are becoming electronic communications providers to the companies with which they work.

In building such systems, Johnson said, CIOs are both licensees for their own companies and facilitators for client and supplier companies. They must not only be concerned about licensing the package for the host machine; they must also collaborate with various parties to establish the terms and conditions under which software is used by customers and suppliers to send communications from their systems to the host.

Ultimately, Johnson said, IS executives need to decide whether their goal is to run an individual company or create a complex network of suppliers and consumers—essentially, a marketplace. If it's the latter, they must build contracts that look more like strategic alliances than simple licenses, and the person at the center has to be very clear about the ground rules for communications so there can be no misunderstanding as to who will be granted access to the system.

These developments provide an opportunity for software and systems vendors to rethink their



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Applications Due:
May 15, 1993

**Judges Select
Winners:**
September 1993

**Announcement of
Winners:**
January 1994

Awards Ceremony:
Spring 1994

ever thought make that kind of the bottom line.”



In essence, the ESPRITSM Award goes beyond recognition. It is an opportunity to provide hard, tangible facts about return on investment from information technology to the business community at large. It is an opportunity to demonstrate how partnering between business and technology executives can increase the effectiveness of both and accelerate the achievement of strategic objectives. By communicating the payback, *CIO* and Booz·Allen & Hamilton hope to encourage other businesses to invest in IT to ensure their survival in a fiercely competitive global market. The award recognizes those who have successfully provided value with IT, while providing *CIO* readers with the ammunition to both justify spending on information technology and measure IT's ROI.

Our Challenge to You

If your technology investment is paying off in this way, we want to hear about it....

We urge you to participate by filling out the ESPRITSM Awards application form. The January 1994 issue of *CIO* will feature the companies, government agencies and not-for-profit organizations that have proven that partnered IT investments can have a positive and sustained impact on the bottom line. Then in early 1994, *CIO* and Booz·Allen & Hamilton will host a special awards ceremony honoring these winning organizations.

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STATEMENT OF PURPOSE
Executives are aware of the potential benefits of information technology (IT) but remain unsure of its actual value to their organizations. In order to demonstrate how IT can produce hard-dollar benefits when aligned with business needs, *CIO Magazine* and Booz·Allen &

Hamilton are co-sponsoring the ESPRITSM Awards. The honorees will be public and private companies, government agencies and not-for-profit organizations which have proven that IT investments can have a positive and sustained impact on the bottom line. Winners will be honored at an awards ceremony and profiled in the January 1994 issue of *CIO Magazine*.

CIO will also use the information collected from entrants to provide readers with insights into how to calculate the return on investment from information technology.

We invite information-systems (IS) and business-unit executives to jointly apply for the award, provided that:

- ▶ they can demonstrate, in actual dollars, the return on investment achieved from the application of IT, and
- ▶ they are willing to be featured, along with their system and organization, in a *CIO* article.

CRITERIA

Winners will be chosen by a panel of independent judges from entrants who have sent in completed nomination forms by May 15, 1993. Entries will be judged on the following criteria:

- The measurable financial return to the organization.
- The extent to which that return is aligned with the organization's strategic objectives.
- The extent to which IT was key to the achievement of the return—the "couldn't have done it without technology" factor.

The sponsors and judges will determine the number of awards and the award categories.

Telephone interviews, and in some cases face-to-face interviews, will be requested by the Booz·Allen screening teams. These teams may elect to visit the finalists' sites in order to review in greater depth the entry, the system and the environment in which it is functioning.

DEADLINE

May 15, 1993

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ENTRY GUIDELINES

- The system must have been operational prior to July 1, 1991.
- Entries must be made jointly by the IS executive AND at least one of the business-unit executives for whom the system delivers value.
- Entries must be complete. Incomplete entries may be returned for elaboration or disqualified.
- Entries must be on 8.5x11-inch paper, one side per sheet.
- The entry form may be reproduced.
- Multiple entries from one company will be considered,

but each entry must be submitted separately.

- Vendors, public-relations and advertising firms, consultants and other third parties may NOT apply on behalf of another firm. They may forward this form to the "owner" of the system, or contact *CIO Magazine* to recommend that an entry form be sent.
- All entries must be computer-generated or typed; no handwritten entries will be accepted.
- Where feasible, an additional copy of the entry should be sent on a floppy disk. Electronic entries must be limited to word-processing and spreadsheet packages that are compatible with *Microsoft Word* and *Microsoft Excel* on either a PC or Macintosh platform.

1. COMPANY/BUSINESS UNIT

NAME OF PARENT COMPANY:

CITY, STATE WHERE HEADQUARTERED:

IF A COMPANY, IS IT ☐ PUBLICLY HELD? ☐ PRIVATELY HELD?

ANNUAL REVENUES:

INDUSTRY:

NAME OF BUSINESS UNIT OR ORGANIZATION:

CITY, STATE WHERE LOCATED:

NUMBER OF EMPLOYEES:

2. ENTRANTS

NAME OF ENTERING BUSINESS-UNIT EXECUTIVE:

TITLE:

NAME OF DIVISION, DEPARTMENT OR UNIT:

ADDRESS:

CITY:

STATE:

ZIP:

TELEPHONE:

()

FAX:

()

NAME OF ENTERING IS EXECUTIVE:

TITLE:

NAME OF IS ORGANIZATION:

ADDRESS:

CITY:

STATE:

ZIP:

TELEPHONE:

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FAX:

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3. SUPPORTERS

Please list four people who are willing to be interviewed with regard to the system, its development, its use and the value returned. At least one should be a member of the technology team that developed the system and should have played a significant role. At least one should be a primary user from the sponsoring business unit. The other two may be from either organization or represent suppliers, customers or others intimately familiar with the system.

A. NAME:

TITLE:

TELEPHONE:

()

REASON FOR INCLUSION:

B. NAME:

TITLE:

TELEPHONE:

()

REASON FOR INCLUSION:

C. NAME:

TITLE:

TELEPHONE:

()

REASON FOR INCLUSION:

D. NAME:

TITLE:

TELEPHONE:

()

REASON FOR INCLUSION:

4. THE NOMINATED ORGANIZATION

Please tell us about your organization (company, business unit, agency) in 500 words or less. Include information on:

- when the organization was founded;
- mission statement;

- major products and services;
- markets served, and
- any other data you believe relevant in terms of general background.

5. THE NOMINATED SYSTEM

Tell us about the nominated system and demonstrate its ROI by completing the following sections. Please limit your material to five pages.

- **Objectives:** Identify the primary business objectives of the IT investment.
- **Scope and Impact:** Identify the functions (e.g., customer service, manufacturing, planning) that were changed by the system, the nature of those changes and their impact on the business. Identify other business-change initiatives tied to the IT investment.
- **Alignment with Strategic Objectives:** Describe how the technology investment is aligned with the organization's strategic objectives, including any new business initiatives. Note any significant event that would help us evaluate the nominated system's value. Examples might include a merger, a new distribution channel or a significant regulatory change.
- **The Importance of IT:** Identify the different components of the overall business change (e.g., business reengineering, downsizing, cycle times). Explain the importance of the IT component to the overall business change.

6. TECHNICAL PROFILE

Briefly describe the technology of the nominated system. Please include the names of major vendors and products. If you prefer, you may attach a document containing a technical description of the system, providing it is no more than five pages.

NOTE: The examples provided here are meant to be illustrative, not all-inclusive.

- **Architecture** (e.g., mainframe, distributed, client/server)
- **Hardware** (e.g., mainframe/parallel processor, minicomputer/server, desktop computers, handheld/portable devices)
- **Software** (e.g., operating systems, database system, shells, application software)
- **Software development tools** (e.g., CASE, 4GLs, GUI developers, object-oriented development tools)
- **Networking/Communications hardware, software and**

services (e.g., modems, routers, electronic-mail packages, carriers and public networks)

7. TRUTH OF INFORMATION/RELEASE

The following release must be signed by both nominating executives if the nomination is to be considered. Unsigned releases will invalidate the entry.

I hereby state that the information provided is true and complete to the best of my knowledge and belief.

I authorize the release and use of, in connection with the ESPRITSM Awards program, any and all materials furnished by me or others at the company contacted for this judging. I understand that information submitted on this entry form or subsequently gathered during the evaluation and judging process may be used in articles or any other type of publicity relating to the ESPRITSM Awards program.

I also authorize the release and use of my name, my company's name and my likeness, including but not limited to any photographs and any recording of my voice or image that may be taken of me for *CIO* Magazine. I agree that no compensation shall be due me or my company for such usage.

I recognize that failure to meet these conditions or to provide sufficient material that can be published can cause the nomination to be rejected at any point in the process at the sole discretion of the sponsors.

SIGNATURE OF NOMINATING BUSINESS EXECUTIVE:

DATE:

SIGNATURE OF NOMINATING IS EXECUTIVE:

DATE:

8. OTHER EDITORIAL OPPORTUNITIES

If you are not selected as an award recipient, are you willing to be contacted for inclusion in other articles in *CIO* Magazine? Yes ☐ No ☐

How did you learn about the ESPRITSM Awards program?

- | | |
|--|---|
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| ☐ Booz·Allen & Hamilton | ☐ Academician |
| ☐ IS staff member | ☐ Consultant |
| ☐ Other publications | ☐ Systems integrator |
| ☐ Other (please identify) | |

C H E C K L I S T

Have you filled out...?

- ☐ Company/Business-Unit, Entrants and Supporters Information
- ☐ Return on Investment Chart

Have both entrants signed and dated...?

- ☐ Truth of Information/Release

Have you included on separate pages...?

- ☐ Nominated Organization
- ☐ Nominated System
- ☐ Technical Profile
- ☐ Additional Return on Investment Material

Have you checked off...?

- ☐ Other Editorial Opportunities
- ☐ How you learned about the ESPRITSM Awards program?

9. QUANTIFYING RETURN ON INVESTMENT

Directions

- The table below provides a framework for breaking down costs and benefits. Feel free to break down any line item into additional components, or to add new line items if necessary. Please explain how the figures were arrived at, on separate sheets if necessary.
- In quantifying costs and benefits, every effort should be made to quantify strategic and "intangible" benefits (e.g., competitive positioning, risk management). It would be helpful to attach any documents you have prepared that explain the system's costs and benefits.
- You may also include your own return on investment calculations and frameworks to further explain your return on investment. These can be attached to your nomination form.

Guidelines for Quantifying Return on Investment

- Provide return and investment figures five years out from initial implementation. Where the system has been in operation for less than five years, you may project future investments and returns *based on historical data*.
- All investments and expenditures made before implementation should be included in year "zero."
- Distinguish actual costs and benefits from projected costs and benefits.
- To the extent the nominated system replaced older technology, the system investment reflected in the tables should be net of corresponding salvage values and ongoing costs.
- Return and investment figures should be stated on an approximated after-tax basis.

NOTE: The examples provided below are meant to be illustrative, not all-inclusive. All numbers are subject to verification.

	Year 1 19 ____	Year 2 19 ____	Year 3 19 ____	Year 4 19 ____	Year 5 19 ____	TOTAL
Return:						
Incremental profits from enhanced revenue (e.g., new revenue streams, productivity improvements)						
Reduced operating costs (e.g., labor, material)						
Reduced capital investments (e.g., capital equipment)						
Reduced inventory						
Indirect cost avoidance (e.g., avoided hiring, fines, fees)						
Total Annual Return	\$	\$	\$	\$	\$	\$
Total Return: \$						

	Year "0" 19 ____ - 19 ____	Year 1 19 ____	Year 2 19 ____	Year 3 19 ____	Year 4 19 ____	Year 5 19 ____	TOTAL
Investment:							
Technology purchases (e.g., hardware, software, lease payments, amortization)							
System development and implementation (e.g., systems integration and consulting fees, initial training)							
Ongoing system maintenance and enhancement (e.g., updating system, maintaining and replacing software, adding users)							
Ongoing system operations (e.g., ongoing training and consulting, help desks, other ongoing support)							
Non-systems operational charges (e.g., increased labor or inventory, early retirement program for laid-off employees)							
Total Annual Investment	\$	\$	\$	\$	\$	\$	\$
Total Investment: \$							
Total Return on Investment: \$ (Total Return minus Total Investment)							

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Strategic Partnering for Return from
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licensing strategies in light of the new kinds of values their products are bringing, Johnson said. Instead of just empowering a single user, they may be supplying the backbone of an enterprise or even a marketplace. In that context, strategies might make sense that wouldn't have made sense under an earlier paradigm.

To increase dependence on the system, for example, vendors might want to give away server software or relax traditional limitations on making copies or allowing access. They might also want to count usage in terms of transactions rather than the number of machines.

Many of these issues remain to be decided, but in developing new models, users are likely to hold software vendors to higher standards of customer satisfaction than in the past. Already, many are negotiating software licenses that tie payments to their satisfaction with the product. Some corporations purchasing large-scale systems are writing implementation benchmarks into the software license to keep the vendor honest, according to Tobey B. Marzouk, a Washington attorney specializing in computer and software law.

In this approach, large-scale system implementation is broken into modules, and benchmarks are set for each. These might include approval of software design specifications, development and testing of software at the vendor site, testing of software at the user site, and acceptance of the module. These benchmarks would be repeated for each module, followed by integration and testing of the entire system and final acceptance. Incremental payments would be made to the vendor as each benchmark is reached.

Users are also building other satisfaction safeguards into licensing agreements. Among the most common is a provision for source-code escrow: In the event that the vendor fails in its maintenance responsibilities or goes out of business, the user organization is permitted access to the program source code in order to take care of maintenance itself.

While changing approaches to soft-

ware-licensing agreements provide opportunities for IS executives to adapt licenses to their companies' needs, savvy vendors get the same opportunity. Marzouk warned that some vendors will not hesitate to exploit the situation. For example, a vendor might try to lure unwitting customers into an old-fashioned CPU-

*In a world where not
only departments but
companies are
networked together,
licensing will have to
be profoundly different.*

style license through the back door. Marzouk tells of one company that acquired a software vendor and announced plans to renegotiate that vendor's licensing agreements to meet the parent's standard. In redrafting the agreement, the company didn't change the numeric basis of the contract (number of users, number of transactions or whatever), but it did change the maintenance agreement by embedding a stipulation that the user agreed to pay upgrade fees—even though the original license agreement allowed upgrades without additional cost. "[It was] very sneaky and completely outside the bounds of the original contract," Marzouk said.

Other licensing provisions, though legitimate, can restrict a corporation's flexibility. For example, many vendors attempt to limit outsourcing, because when software is transferred to an outsourcer, the vendor loses control. Vendor licenses might therefore include provisions to restrict a customer's ability to assign or outsource the software to another party, or if they do allow the customer to assign it, there will be an assignment fee.

Wherever there are negotiations and contracts, the possibility of litigation rears its ugly head. Under-

standing how the courts have been leaning can help a CIO negotiate a contract that won't need to be litigated down the line. In some recent cases, courts have held that the business underpinnings of an agreement outweigh the letter of the contract. Marzouk told of a case in which a business with a site license was acquired, and the purchasing company decided to move the entire operation across the country. The vendor of the site license demanded another license fee. Admittedly, the purchasing company had violated the terms of the license because it moved the operation to a different site. But because the system was unchanged and there would be no additional maintenance cost to the vendor, the company argued that the business underpinnings of the license had been respected. The court agreed, and no second license was required.

Another area where the courts have been increasingly merciful to users is that of vendor liability. Software licenses generally provide that in a case of software failure, a user can sue a vendor only for the license fee, not for consequential damages such as lost revenues resulting from the failure. Recently, however, courts have been willing to strike vendor limitations of liability in a license if the amount of the license fee doesn't adequately compensate the user for losses.

Many potential litigants are forgoing the courtroom in favor of the quicker and less costly option of arbitration. In fact, it is not unusual for a software license to stipulate the use of arbitration rather than courtroom litigation in case of an unresolved dispute.

As the form and substance of technology evolves, the black and white of software licensing becomes increasingly gray. Negotiating a license today is fraught with complexity and peril, but those who know what to watch for—and what to watch out for—have a better opportunity than ever to negotiate licenses that really respond to the needs of their business. ☐

Kathleen Melymuka is a freelance writer based in Duxbury, Mass.

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FYI

A New Point of Departure

The world of pen computing is evolving at a rapid pace, and Fujitsu Personal Systems Inc.'s latest advance along the evolutionary scale is a three-pound pen-based tablet introduced earlier this year. The 325Point is designed to run decision-support applications for mobile workers in vertical markets such as consumer packaged goods, utilities, pharmaceuticals, transportation and health care.

The hardware runs on an AM386SXLV chip and comes with 4MB of upgradeable RAM. The unit accepts an optional 1.8-inch credit-card-type hard disk. The LCD display can be backlit on demand, has a resolution of 640-by-480 pixels and supports 64 gray scales. The screen measures 9.4 inches diagonally. Battery life is rated at three to eight hours, depending on usage. For operating software, the tablet supports Microsoft Corp.'s Windows for Pen Computing, CIC's PenDos and GO Corp.'s PenPoint.

The preliminary price for the 325Point is \$2,295. For more information, contact Fujitsu in Santa Clara, Calif., at 800 831-3183.

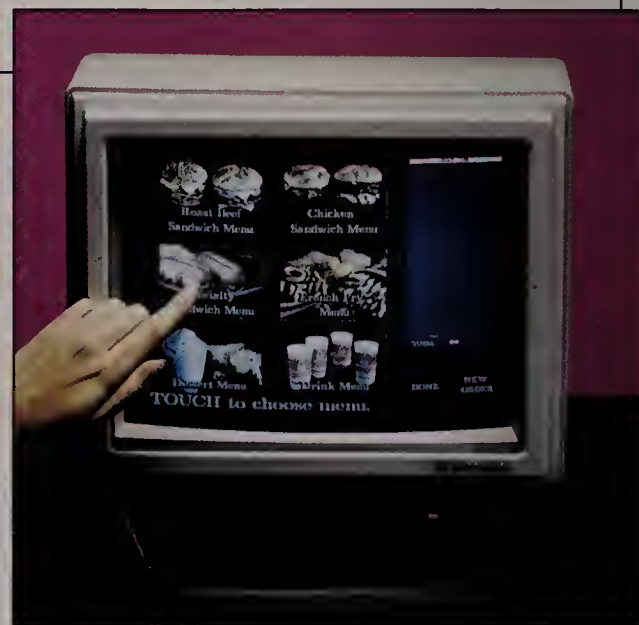


The Herding Instinct

Do you know where your PCs are? Or even how many you have? Comdisco Inc. offers a PC-based tool to track and manage those elusive PC assets. CLASS is a Windows-based product that allows companies to assess, acquire and manage small technology equipment such as PCs and printers; it can also be configured to track other assets, such as chairs and desks. Since CLASS is designed as an EDI product, users can set up the product to manage approved-vendor—and approved-price—purchasing and to police standards in-house. Sounds fine for managing purchases from today forward—but what about all those PCs purchased willy-nilly over the last several years? CLASS will draw into its database information about technology purchases from traditional mainframe-based fixed-asset systems. Comdisco also offers a full range of consulting services for CLASS users, including data conversion, training and testing. Comdisco will even arrange for a manual inventory (and bar-coding) of every PC throughout the enterprise. Prices for CLASS start at \$8,000. A LAN version is available. For more information call Comdisco at 708 698-3000.

A Light Touch

For companies inclined to add a little more intuitiveness to their computer systems, MicroTouch Systems Inc. of Wilmington, Mass., offers a low-cost plug-and-play touch screen that will snap on to the front of virtually any 13- or 14-inch monitor. QuikPoint GX140 is designed for developers who want to add touch capability to regular monitors and can be installed in less than three minutes, according to MicroTouch. The product's touch technology responds to the electrical charge in a human finger rather than to pressure. The screen consists of an all-glass sensor with a uniform A/C voltage field spread over its surface; when a user touches the surface, current is drawn to his or her finger. This technology is impervious to water, dirt, dust and grease, according to the company, and it is not affected by vibration or jostling. Clients like the snap-on aspect of the product because they can switch monitors while preserving their investment in the touch screen. The GX140 costs \$695 and is available from MicroTouch at 508 694-9900.



Don't Get Caught with Your Computers Down

There are little faults, like forgetting to screw the top back on the toothpaste tube, and there are big faults, like the kind that routinely knock out computerized reservation systems, ATM machines and other mission-critical applications. For corporations that base their reputations on customer service, the latter can be lethal.

NCR's LifeKeeper FRS is a set of software, services and tools that brings fault resiliency, or "near fault tolerance" to NCR's line of midrange systems. The product offers users increased availability and provides automatic failure detection and recovery from system, application and component failures.

LifeKeeper links NCR System 3000 computers to ensure total system availability for mission-critical applications such as self-service banking, credit authorization and online access to medical records. For example, one system may run a mission-critical application while a second runs lower-priority tasks. If the first system fails, LifeKeeper enables the second machine to take over the essential application, with system recovery time of typically less than two minutes.

Prices for LifeKeeper FRS range from \$6,000 to \$30,000. Call 800 225-5627.



I N D E X

Page numbers refer to the first page of the article(s) in which the company is mentioned. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

Company Index

3Com	14
AT&T	32
Amdahl Corp.	50
Apple Computer Inc.	14
Bull/Zenith	14
Canadian Paper Mills	14
Canon	14, 42
Comdisco Inc.	74
Compaq Computer Corp.	14, 42
Conrail	14, 42
DAP Technologies	50
Decision Support Technology Inc.	14
Deloitte & Touche	14
Digital Equipment Corp.	14, 66
Early, Cloud & Co.	76
Elixir Technologies Corp.	14
Etak Inc.	14
Federal Express Corp.	42
Foothill Group Inc.	42
Ford Motor Corp.	14
Frito-Lay Inc.	42
Fujitsu Personal Systems Inc.	74
General Dynamics	50
Geographic Data Technology Inc.	14
GO Corp.	74
GPU Nuclear Corp.	50
GRiD Systems Corp.	14, 42
IBM Corp.	14, 42, 50, 76
L.L. Bean	58
LINK Resources Inc.	42
Lotus Development Corp.	42, 50
Lynch, Jones & Ryan	42
Metropolitan Edison Co.	50
Microsoft Corp.	74
MicroTouch Systems Inc.	74
NCR Corp.	74

Nabisco Biscuit Co.	76
Nalco Chemical Co.	42
Northrop Corp.	14
Novell Inc.	42, 76
O'Reilly & Associates	14
Otis Elevators Co.	42
Pacific Bell	32
Rochester Gas & Electric	42
Sales Technologies Inc.	42
Sun Co.	50
Sun Microsystems	14
TRW Inc.	32
Texaco	58
Texas Instruments Inc.	42
Time Warner Inc.	14
Toshiba	14
Travelers Companies, The	42, 58
WordPerfect Corp.	42
Xerox Corp.	14, 58

Advertiser Index

AT&T	7, 22, 72
AT&T Technologies	37
Ameritech (Regional)	28A
Andersen Consulting	8A, 65
Bell Atlantic (Regional)	12
Bull Information Systems	57
CIO Publishing Inc.	9, 29, 68A, 69
Computer Associates International Inc.	2, 55
Computer Bowl	C3
Dexpo	15
Digital Equipment Corp.	C2
IBM Corp. (Regional)	12
Information Builders Inc.	11
Informix	C4
Landmark	25
Lotus Development Corp.	18
New York Telephone	47
Novell Inc.	4
PC Expo	71
Society for Information Management	63
Software 2000	27
SynOptics Communications Inc.	30
Tandem	21
Unitech	17
World Expo Corp.	61
Xerox Corp.	67

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Computer-Aided Bake Sales

By centralizing the telemarketing function and providing sales reps with a network to access existing host-based applications, Nabisco has improved customer service and opened the door to expanding its business

In most sales efforts, there comes a point of diminishing return, when the cost of making a sale begins to outweigh any profits it might reap. That's the problem the Nabisco Biscuit Co. of East Hanover, N.J., faced back in 1991. Sales reps serving small customers around the country were having difficulty managing existing accounts. The geographic dispersion and a lack of systems support prevented them from providing the level of service Nabisco wanted and made it difficult to pursue new accounts in an ever-expanding market.

"We wanted to centralize [the small-accounts sales function] and put some professional telemarketing and management capabilities behind [it]," said Wayne Shurts, the senior director of sales operations. Large accounts were served by a direct field sales force, but the cost of having reps visit every mom-and-pop store would have been prohibitive. The company's existing telephone operations were insufficient because reps didn't have quick access to crucial customer data. "We wanted to design a customer network specifically for

our smaller accounts" to provide them with the same level of service as large customers without sending reps out into the field, Shurts said.

The IBM mainframe at Nabisco's data center in Wilkes-Barre, Pa., was already home to many systems that could help customer-service representatives be more effective. Major applications included the customer master file; order entry; trade promotions; and inventory, invoice and sales histories. "We wanted to add some telemarketing functionality and transparently link all of the core applications," Shurts explained.

Existing applications were CICS-based. After evaluating several software packages, Nabisco selected the CICS version of the Teleservicing Control System group of products from Early, Cloud & Co., of Newport, R.I., because it offered telephone integration, telemarketing, queue management, scripting, fulfillment and speed-dial features.

Today, about 20 customer-service reps at the data center use a Novell network of 386-based IBM PCs to access telemarketing applications on the mainframe.

During a sales call,

reps use online scripts to conduct transactions and capture order information, which is then sent automatically to a distribution center. Reps are able to transparently access a variety of applications that enable them to serve their customers more quickly. "They have complete historical information to draw from, which means they have a lot more knowledge to work with," said Shurts.

Customers will soon be able to place orders through a voice-response unit (VRU) 24 hours a day. If a customer needs to speak to a representative during the call, the data entered into the VRU will be transferred with the call, eliminating the need for the customer to repeat information. The new system has improved productivity, enabling Nabisco to reduce its customer-service staff for small accounts by a third.

Now that the network has proved its mettle, Shurts has new expectations. "We plan to add more telemarketing people to go after new channels in areas like video stores and stadiums," he said. "We hope to double our business, which wouldn't be possible without the technology."

—Megan Santosus

VITAL STATISTICS

Organization: Nabisco Biscuit Co., East Hanover, N.J.

Application: Customer-service network

Technologies: A Novell LAN of IBM 386s linked to an IBM mainframe and integrated with CICS-based Teleservicing Control System software from Early, Cloud & Co.

Scope: Small-account customer-service representatives working out of the company data center in Wilkes-Barre, Pa.

Sponsor: Wayne Shurts, senior director of sales operations

Objective: To centralize the telemarketing function for small accounts, add functionality and transparently link all of the core customer-service applications

Payoff: Improved service to small accounts; increased productivity, enabling a reduction of small-account customer-service staff by a third

Added Value: Facilitates business expansion into new markets by enabling the company to pursue remote accounts

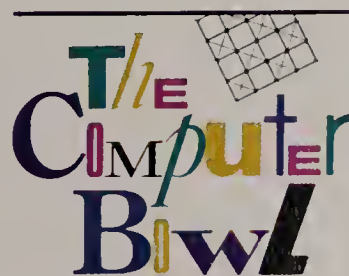
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The Computer Museum's 1993 Computer Bowl Presented By: The Association for Computing Machinery (ACM); Date: May 14, 1993; Place: The San Jose Convention and Cultural Facilities, San Jose, California; Satellite broadcast to: The Computer Museum, Boston, Massachusetts.

EAST COAST TEAM: Mitchell E. Kertzman, Captain, Powersoft Corporation; John F. Burton, LEGENT Corporation; Neil J. Colvin, Phoenix Technologies Ltd.; Alain J. Hanover, Viewlogic Systems, Inc.; Patricia B. Seybold, Patricia Seybold Group. WEST COAST TEAM: Harry J. Saal, Captain, Network General Corporation; Jean-Louis Gassée, Be Incorporated; Jerry Kaplan, GO Corporation; Michael A. McConnell, SuperMac, Inc.; Lisa G. Thorell, Dataquest Incorporated. "THE EXAMINER," Bill Gates, Microsoft Corporation. JUDGES: Dr. David L. Nelson, Fluent, Inc.; John F. Shoch, Asset Management Company. FOUNDERS: Pat Collins Nelson and Dr. David L. Nelson. UNDERWRITERS: Apple Computer, Inc. OFFICIAL SPONSORS: Bank of Boston, The Bank; BASF Information Systems, The Diskette; Intel Corporation, The Microprocessor; LEGENT Corporation, The Enterprise Systems Management Provider; MasPar Computer Corporation, The Massively Parallel Computing Company; Merrill, Pickard, Anderson & Eyre, The Venture Capital Firm; Network General Corporation, The Network Analyzer; Price Waterhouse, The Accounting Firm; Robertson, Stephens & Company, The Investment Bank; Stratus Computer, Inc., The Transaction Processor; Viewlogic Systems, Inc., The Official Electronic Design Automation Company; Visix Software Inc., The High Performance Workstation Software Company; Wellfleet Communications, Inc., The Internetworking Company. The Computer Bowl is broadcast on the PBS series, "Computer Chronicles," hosted by Stewart Cheifet. The Computer Bowl is a project to benefit the educational programs of The Computer Museum, 300 Congress Street, Boston, MA 02210. For tickets and sponsorship information (617) 426-2800 ext. 399.



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